Do Data-Driven Assessments affect Creativity?

Stephanie Butler

NAEA, 2016
Chicago
Background

Founding faculty of a charter school.
Art Program creator.
Art teacher.

Traditional grading, then standards-based grading, then data-driven instruction.

All teachers directed to employ DDI and this data-tracking software in their curriculum.
The data

* Assessments ↔ Content Standards

* Data ↔ all stakeholders.

* Predictor for state and national standardized exams.

Multiple Choice

True / False

Multiple Answer Responses

Rubric grading still read by data scanner

Mostly quantitative answer options
The problem

How does this work in Visual Art?
Will it affect my student work?

more specifically...

Does the use of **quantitative** data-driven instruction and assessment in the Visual Arts curriculum decrease creativity?
Preface

The Purpose of Creativity in Arts Education

- Outcome: Creative and innovative thinking (Dwyer, PCAH, 2011 p. 8)
- Top 5 Applied Skills (Ruppert, 2010)
- Art uses creativity to develop higher order thinking and communication (NAEP, 2008)
A statement of a learning objective contains a \textit{verb} (an action) and an \textit{object} (usually a noun).

- The \textit{verb} generally refers to [actions associated with] the intended \textit{cognitive process}.
- The \textit{object} generally describes the \textit{knowledge} students are expected to acquire or construct. (Anderson and Krathwohl, 2001, pp. 4–5)

In this model, each of the colored blocks shows an example of a learning objective that generally corresponds with each of the various combinations of the cognitive process and knowledge dimensions.

Remember: these are learning objectives—not learning activities. It may be useful to think of preceding each objective with something like: "Students will be able to ..."
Review of Literature

**Assessment of Creativity**
- Creativity = outcome of process + product
- Social process
- Domain, Field, Individual
- Contextual within domain
- Consensually determined
- Heuristic, not Algorithmic

**Authentic Assessment**
- Qualitative
- Divergent thinking
- Enabling and forward-looking
- Abilities over answers
- Student/Teacher cooperative
- Intrinsic and Extrinsic
- Most items = valid assessment.

**Quantitative Data-Driven Instruction**
- Quantitative
- Convergent thinking
- Primarily assessment, secondarily instruction
- Assessment precisely match state or national standards
- Extrinsic
- One item missing = invalid
Methodology

Pretest
Lesson 1 (Tar-Paper Slab Vessel)
Discussion Board A: What is Creativity?
Students Self-Evaluate, Teacher Evaluation

Discussion Board B: Which surface treatments would you employ?
Student-Generated Creativity Rubric
Discussion Board C: List how you will make it more creative than the first?

Treatments:
CONTROL POSTTEST ASSESSMENT MOTIVATION:
How can we increase our creativity?
EXPERIMENTAL POSTTEST ASSESSMENT MOTIVATION:
How can we increase our creativity scores according to the rubric?

Posttest Evaluation
INSTRUMENT A:
Expert Panel Posttest Only Experiment
INSTRUMENT B:
Creativity Pretest/Posttest Gains Experiment

Art Experience
Student Survey
Determine Control and Experimental Groups, Medium and Project

Pretest Evaluation
Lesson 2 (Surface Treatments)
Discussion Board B: Which surface treatments would you employ?
Student-Generated Creativity Rubric
Discussion Board C: List how you will make it more creative than the first?
How do you measure creativity?

A Social process: Domain, Field, Individual
“Gatekeepers”, Appropriate Observers (Csikszentmihalyi, 1996)
The task must be heuristic, not algorithmic!

<table>
<thead>
<tr>
<th>Synthesis</th>
<th>Novel or Valuable</th>
<th>Idea Generation</th>
<th>Discover or Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work synthesizes ideas in original and surprising ways.</td>
<td>Work is a novel or valuable response to the task.</td>
<td>Work makes you ask new questions to build upon an idea.</td>
<td>Work enables you to discover or learn something not directly instructed.</td>
</tr>
</tbody>
</table>
How can creativity be assessed? By whom?

**Consensually**
Within the Domain, in the Field
Expert Panel Scores:
  *Instrument A*

**Contextually**
Within the Field, in reference to Individual
  Teacher and Student
Rubrics with Reflections:
  *Instrument B*

(Amabile, 1983, 1996)
<table>
<thead>
<tr>
<th>Creativity Criteria</th>
<th>Describe how you did or did not do this criteria in your project:</th>
<th>Rate Your Work 0 - 5</th>
<th>Teacher Rating 0 - 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your work synthesize ideas in original and surprising ways?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is your work a novel or valuable response to the task of the project?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does your work make you ask new questions to build upon an idea?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you discover or learn something by yourself?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student Pretest Images
Control & Experimental Groups
INSTRUMENT A: Expert Panel
Posttest Only Experiment
Instrument A: Expert Panel Posttest Only Results

- No statistically significant difference between groups in creativity scores.
Instrument A: Expert Panel Posttest Only Results

Data Range

**Synthesis**

H1: Expert-Panel defined “Work synthesizes ideas in original and surprising ways.”

**Novel or Valuable**

H2: Expert-Panel defined “Work is a novel or valuable response to the task of the project.”

**Improvement**

H3: Expert-Panel defined “Work is improved from Pretest to Posttest.”

**Originality**

Expert-Panel defined “Work is original from others in the class.”

● No statistically significant difference between groups in creativity scores.
<table>
<thead>
<tr>
<th>Creativity Criteria</th>
<th>Describe how you did or did not do this criteria in your project:</th>
<th>Rate Your Work 0 - 5</th>
<th>Teacher Rating 0 - 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your work synthesize ideas in original and unique ways?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is your work a novel or valuable response to the task of the project?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does your work make you ask new questions to build upon an idea?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you discover or learn something by yourself?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INSTRUMENT B:** Pretest/Posttest Gains Experiment
Synthesis

Work synthesizes ideas in original and surprising ways.

No Significant Difference
Instrument B: Pretest/Posttest Gains Results

Novel or Valuable

Work is a novel or valuable response to the project.

No Significant Difference
Instrument B: Pretest/Posttest Gains Results

Idea Generation

Work Makes Student Ask New Questions, Build Upon An Idea.

Statistically Significant
Discover or Learn

Work enables you to discover or learn something not directly instructed.

Statistically Significant
Results Summary

- Instrument A: Expert Panel
  Authentic Assessment Group showed higher creativity scores, no significant difference

- Instrument B: Creativity Gains
  - Authentic Assessment net gains: +.86
  - QDDIA net gains: -1.99
  - Statistical significance in 2 of 4 categories
Limitations

- Non-Randomized Sample
  - Instruction part of the regular 8th Grade Curriculum
  - No interruption of schedules, instruction

- Medium-Specific: Ceramics
  - Kiln Explosion
  - Incomplete Projects
  - Technical Subjectivities
**Implications of employing Quantitative Data-Driven Instruction / Assessment**

<table>
<thead>
<tr>
<th>Creativity Criteria</th>
<th>0: Not at all</th>
<th>1: A little</th>
<th>2: Some</th>
<th>3: A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work synthesizes ideas in original and surprising ways?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work is a novel or plausible response to the task of the project?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work improved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PostTest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work is original from others in the class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Demonstrates a decrease in measured creativity
- Demonstrates a narrowing of range of creativity scores
- Assessment motivation:
  - Increase creativity?
  - Or increase the score?
  - Intrinsic or extrinsic?
Conclusions, Opinions of employing Quantitative Data-Driven Instruction / Assessment

- Assessment motivations are crucial.
- Assessment methods should be tested prior to mandating implementation.
- Any limit to creativity is counterproductive to overall goals of Art Education.
- Additional research, discussion in Art Education field:
  - Clarify the necessity of practicing and demonstrating creativity in Visual Arts
  - Intrinsic & Extrinsic motivations in creative assessment methodologies
Very Special Thanks:

Thomas D. Butler, Husband
Dr. Carlos Silveira, CSULB Art Education
Dr. Laurie Gatlin, CSULB Art Education
Dr. Erin Craig, E=MC² Consulting LLC, Unity Schools of Southern California
National Art Education Association
California Art Education Association