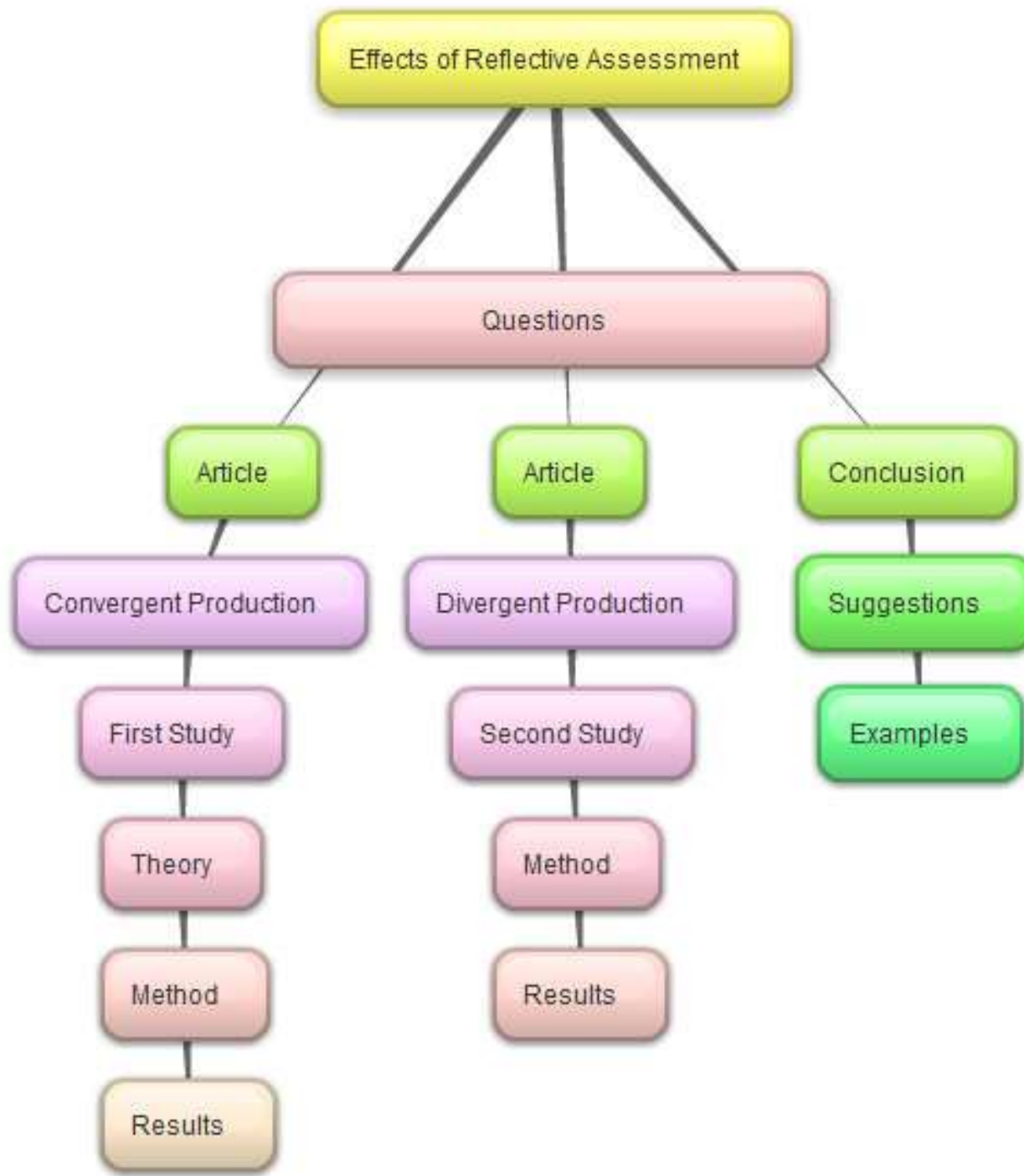


Effects of Reflective Assessment on Middle  
School Students' Academic Achievement  
and Perceptions of Related Instructional  
Practices

By David W. Denton, Ed.D.



"The ultimate aim [of high-stakes testing] is to achieve instructional levels that promote understanding, comprehension, application, and creation of new knowledge (invention, creativity, artistry, writing, research)."

~ Shermis and DiVesta (2011), p. 425

Is this true?

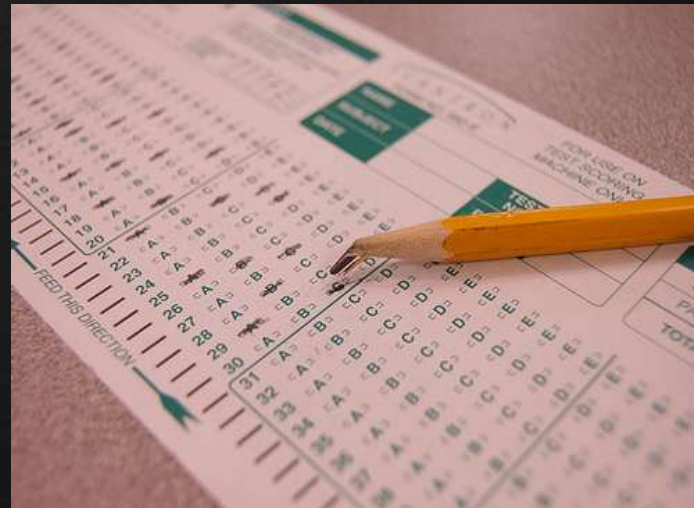
Do we understand this as the aim of high-stakes testing?

What is missing?

Is instruction improving?

Standards-based assessment systems promote understanding, comprehension, application, and creation of new knowledge by students.

# Lee County Schools Warned on FCAT



# Convergent Production

Focused search  
Specific answer  
Possible evaluation





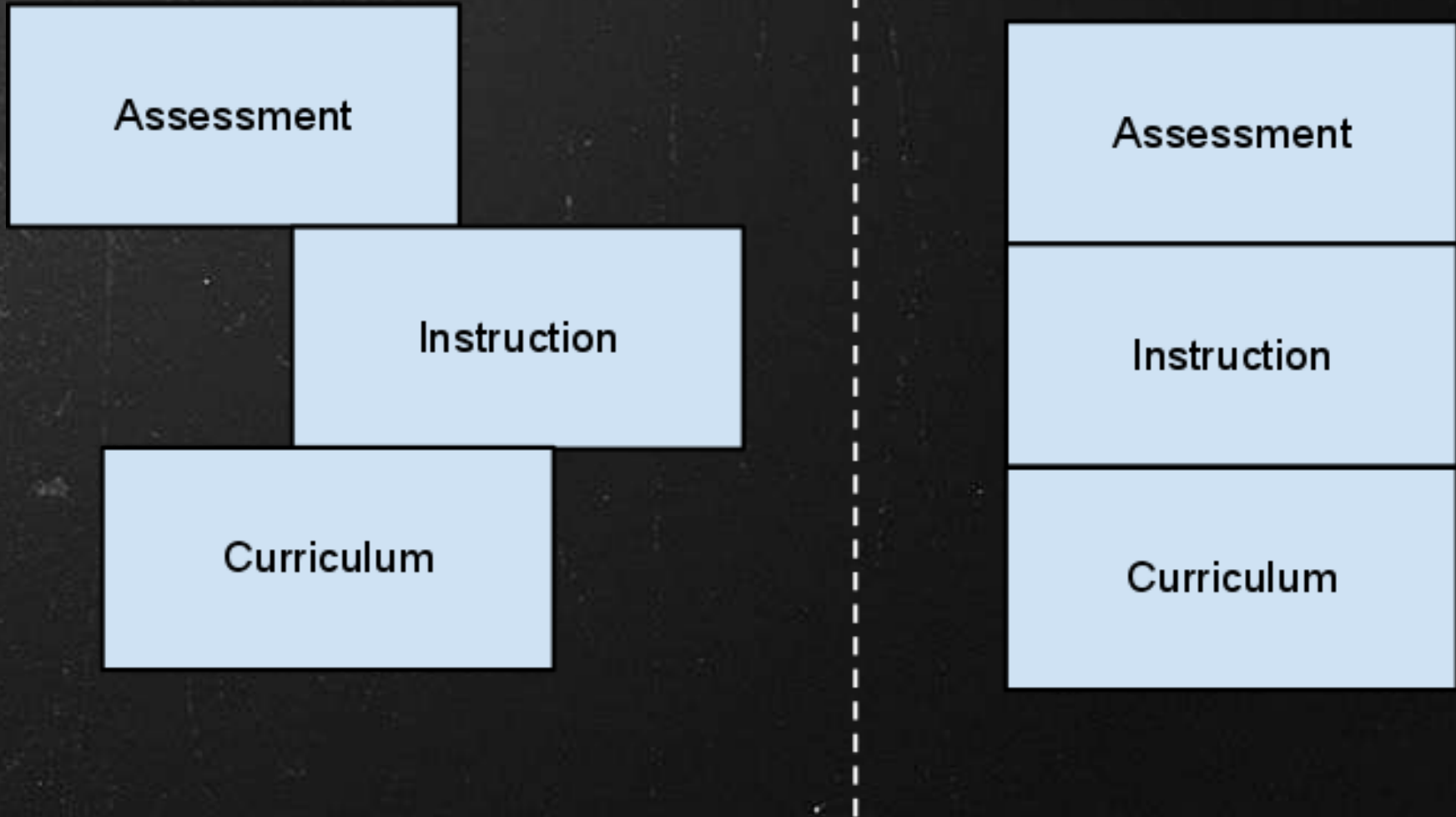
# Template Writing?

Template writing is an **unsurprising** response if the goal is to score well on a test.

# Template Writing?

Template writing is a **reasonable** response if the goal is to score well on a test.

# Alignment



~ Resnick, Rothman, Slattery, and Vranek (2004)

# Possible Causes of Misalignment

Unclear objectives

Ineffective instruction/assessment

Inadequate teaching/learning theories

Excessive content coverage

~ Harniss (2006), Pellegrino, Chudowsky, & Glaser (2001); Pellegrino (2006)

Roach, Niebling, & Kurz (2008); Tindal and Nolet (1996); Porter & Smithson, 2001

# Intent of Testing

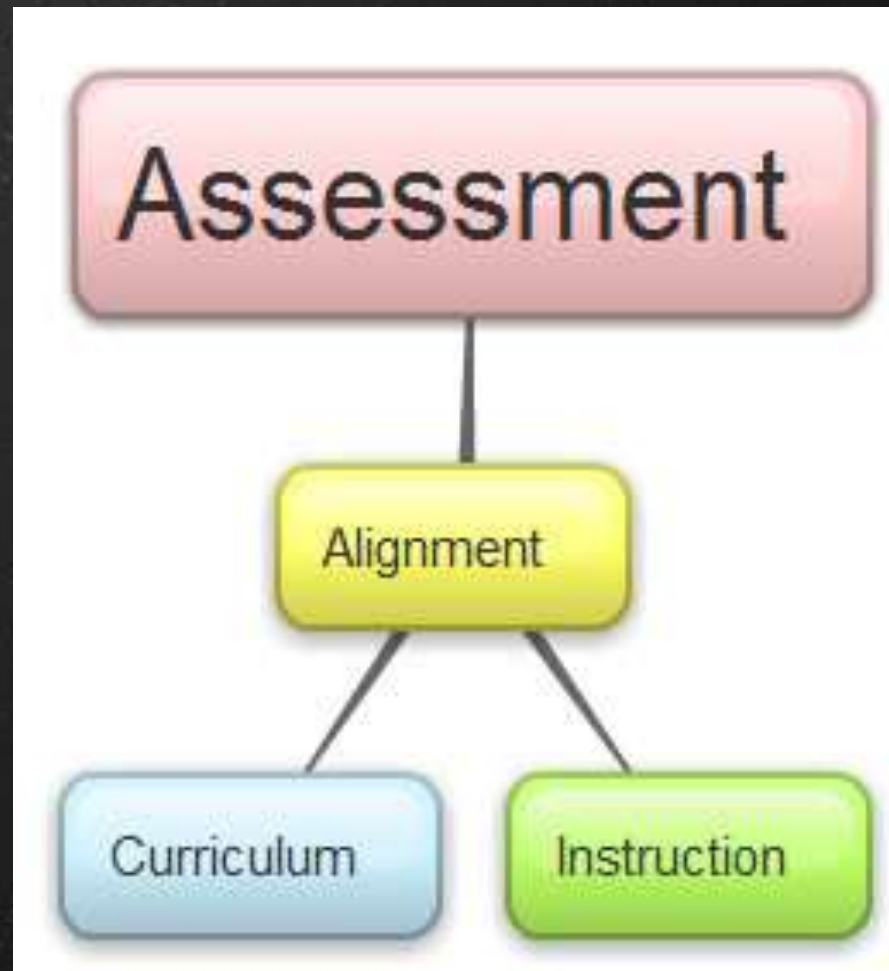
"When the intent of high stakes tests is poorly understood or perceived, they tend to encourage curricula and instruction that are aimed at producing high scores on the tests. In doing so, they squeeze out other, more important (effective) methods of learning, thereby constraining (narrowing) the curriculum..."

~ Shermis and DiVesta (2011), pp. 443-444

What is the intent of testing?

Do educators generally understand the intent?

# Alignment



First Research Study

# Why reflection?

National Council for the Social Studies

National Council of Teachers of Mathematics

National Science Teachers Association

Partnership for 21st Century Skills

National Board for Professional Teaching Standards

National Foundation for the Improvement of Education

# Empirical Support for Reflection

## Previous studies

### Student Journals

Ruiz-Primo et al. (2004), 5th grade science

Reflective prompt and strategy

Song et al. (2006), problem-based learning

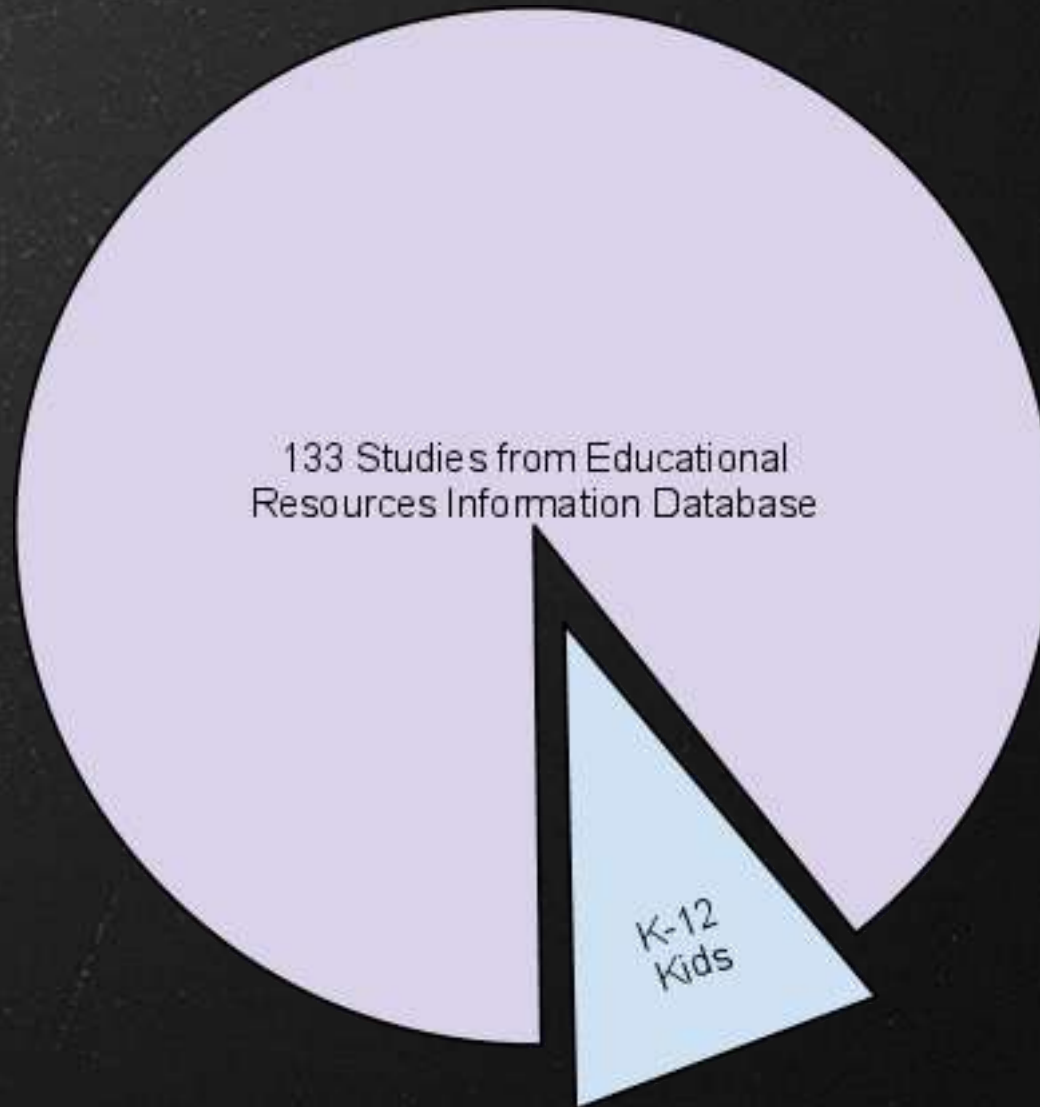
### Feedback

King (1991), 5th grade problem solving

### Metacognition

Dignath and Büttner (2008), math/science focus

# Why reflection?



# Why reflection?

## What is reflective thinking?

Active

Persistent

Careful

Grounded

Promotes meaningful conclusions

~ Dewey, 1910

# Which characteristic is most important?



- Active
- Persistent
- Careful
- Grounded
- Promotes meaningful conclusions

# Setting

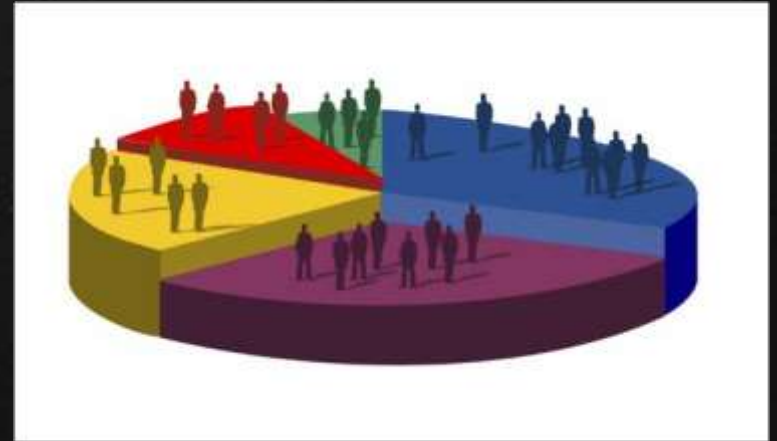
District enrollment 6,700

Middle School enrollment 78878%

European American 29%

free/reduced 13% learning disabled 3%

transitional bilingual



# Participants

259 students

126 female/133 male

23 special education

7 English language learners

75 free/reduced

7th grade social studies

10 intact classrooms

3 teachers

# Intervention

23 days

10 minutes - 50 minute class

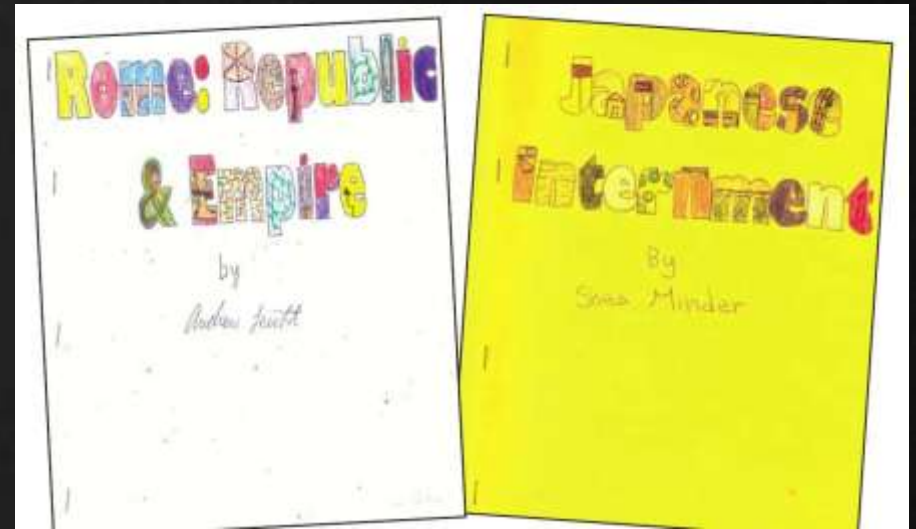
Reflections

Journal

Prompt

Teacher feedback

Peer check



# Example Prompts

These three words best define *artifact*.

This crosscut saw tells us that....

Mechanization is a process that....

What have you learned?



## Example Response I

"i [sic] have learned about the logging industry and how our technology and economy has changed over the years i see how our economy is being impacted and how dramatic the change of the numbers of people employed is than it was a hundred years ago...."

## Example Response II

"I have learned about logging. Which [sic] they mark the tree's to know which ones to cut. They also have a surveyer who tells which trees to cut and the best way. They also log in the fall and winter, because those are the best logging weathers and times. I also learned how they logged and what tools they used. From past to present."

## Example Response III

"i [sic] have learned about old logging and how to examine an artifact"

# Example Response IV

"loooooooooooooooooooooooooooooogging"

# Example Teacher Feedback

"nice reflection"

"please write more about your thinking next time"

"good idea here"

"I appreciate what you have written, thanks"

"What about...[specific error correction]"

# Research Questions

1. Increased achievement
2. Perceptions of instruction
3. Different achieving students

# Summary

## Alignment

259 7th grade students

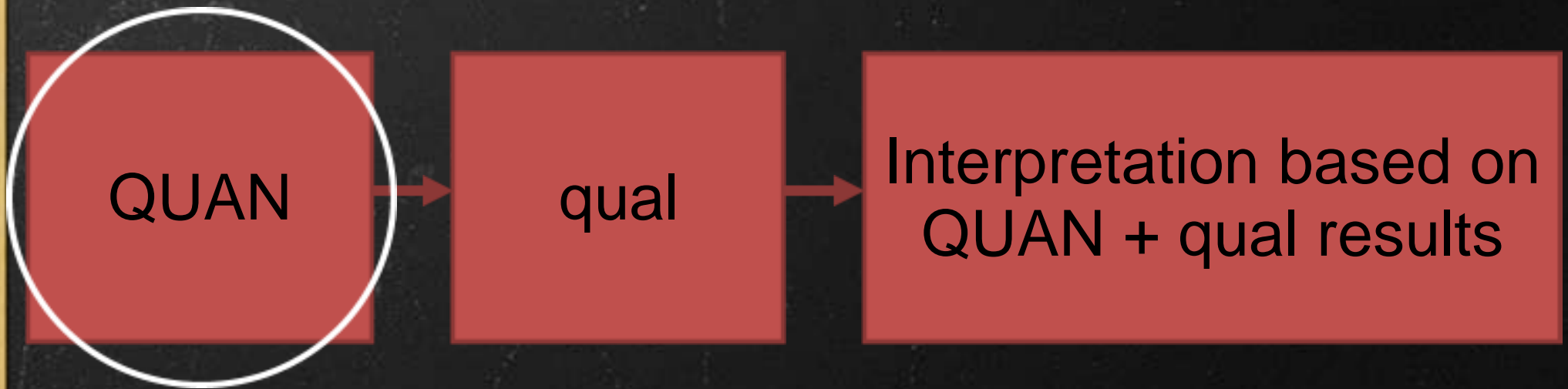
10 classrooms

Social studies

23-day intervention

Characteristics of reflective thinking

# Sequential Explanatory Design



# Quantitative Phase

Content-specific test

Pretest-posttest 38 multiple choice

Student questionnaire

Posttest 6 items Likert scale 1-5

# Example Items

Content-specific test

Student questionnaire

6. Evidence is\*

- A video or picture that an event is right
- Something used in court by a lawyer
- A sign or proof of something that is true
- Something that makes the event true

7. An economic advantage of the lumber industry is that\*

- Sawmills have wood
- Companies buy machines
- People earn money
- Washington exports to Japan

47. There is feedback from the teacher on my social studies assignments \*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

51. I ask myself if I have met the learning target for each lesson in social studies \*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

# Test and Questionnaire Reliability

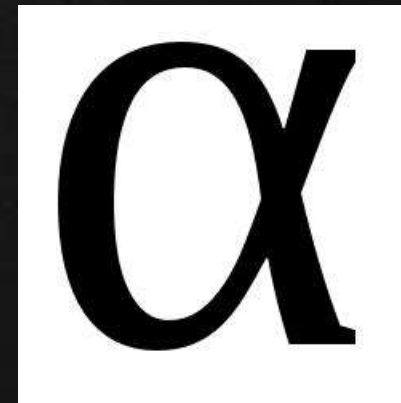
## Reliability

Content-specific test

Pilot test .75 Pretest .71 Posttest  
.83 Retention .80

Student questionnaire

Pilot .78 Posttest .80



# Teacher Assignments for Each Designation

Class Time	Teacher A	Teacher B	Teacher C
------------	-----------	-----------	-----------

---

8:00 a.m.	Comparison 1		Control 1
-----------	--------------	--	-----------

8:56 a.m.	Comparison 2		Control 2
-----------	--------------	--	-----------

9:46 a.m.	Treatment 1	Treatment 2	
-----------	-------------	-------------	--

12:45 p.m.	Comparison 3	Treatment 3	
------------	--------------	-------------	--

1:40 p.m.	Comparison 4	Treatment 4	
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# Quantitative Phase

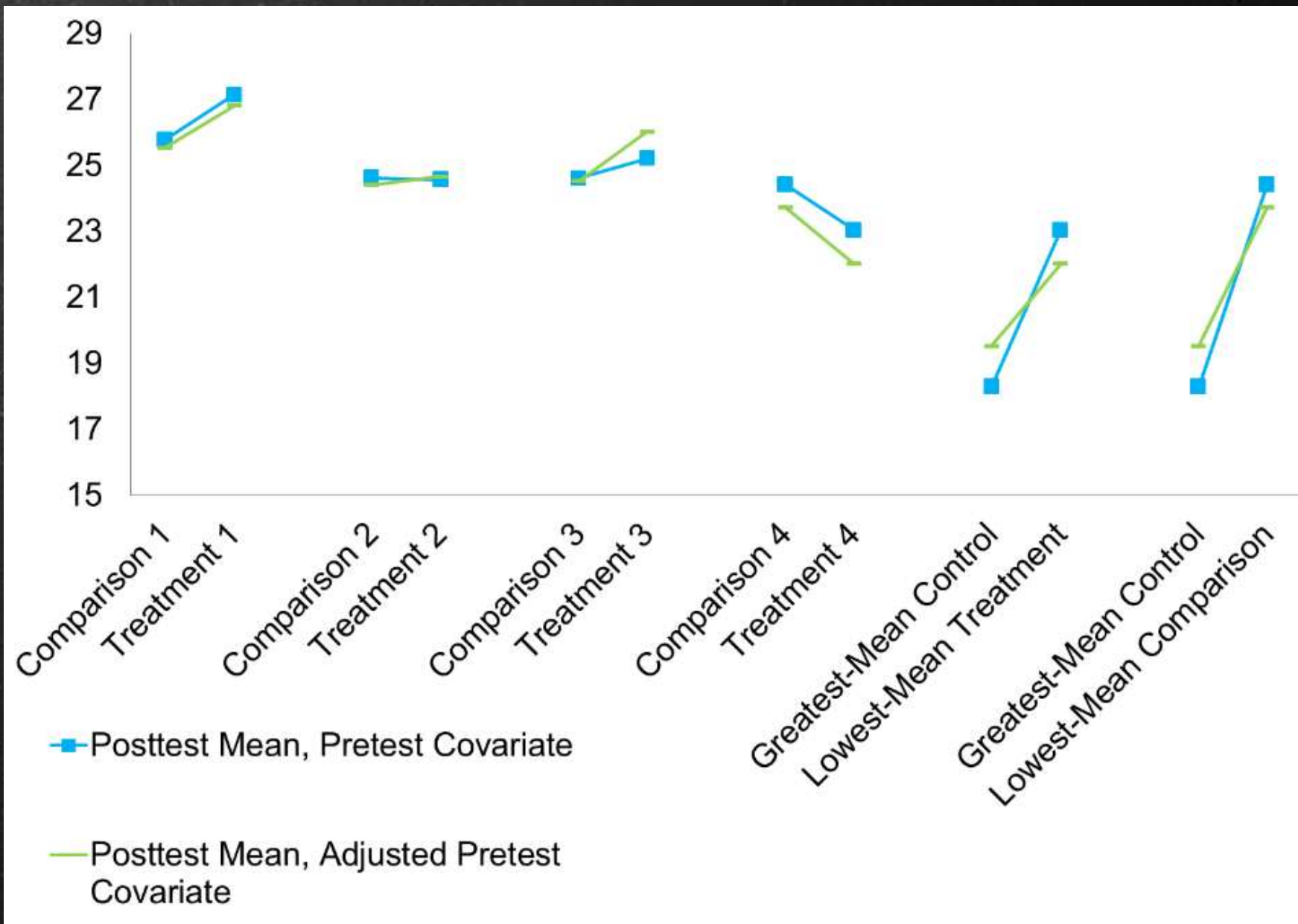
10 intact classrooms

4 treatment 4 comparison 2 control

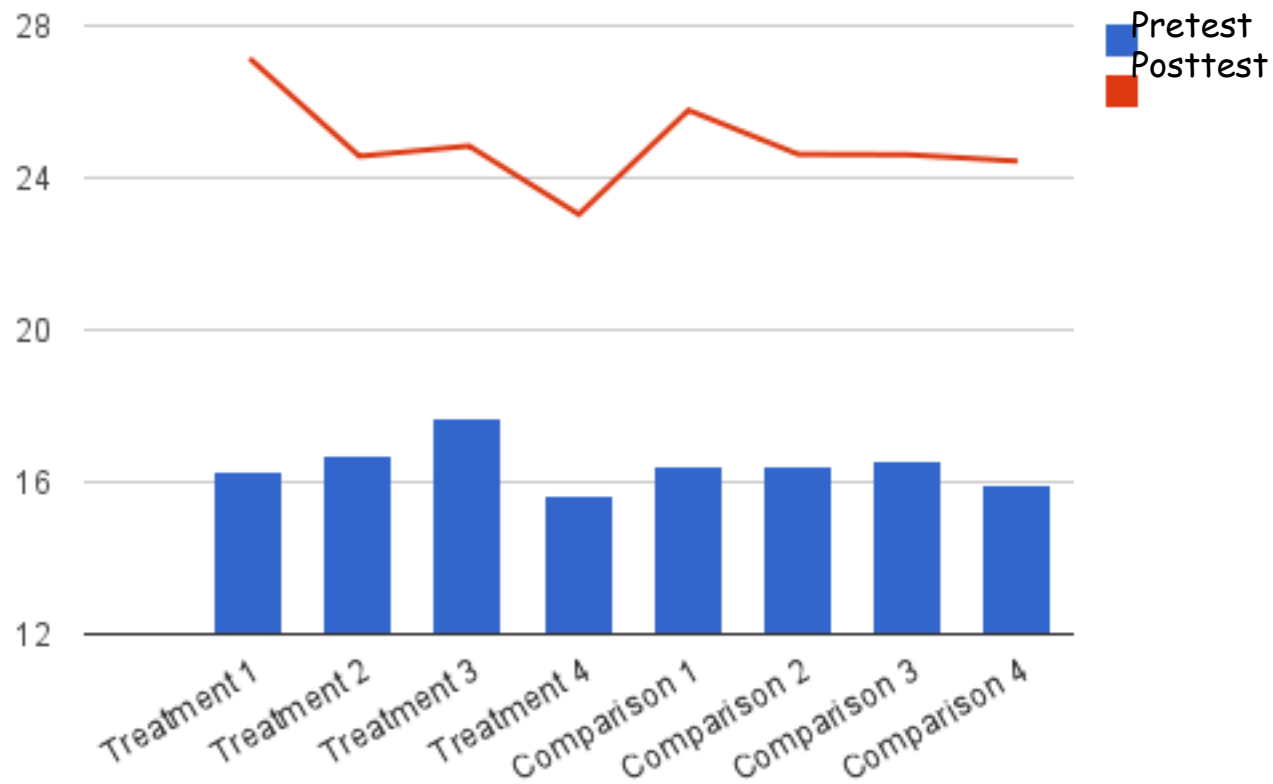
4 pairs of treatment-comparison

Matched Pretest WASL reading and math

# Content-Specific Test



# Change Scores for Each Classroom



# Quantitative Results

Student questionnaire

content-specific posttest

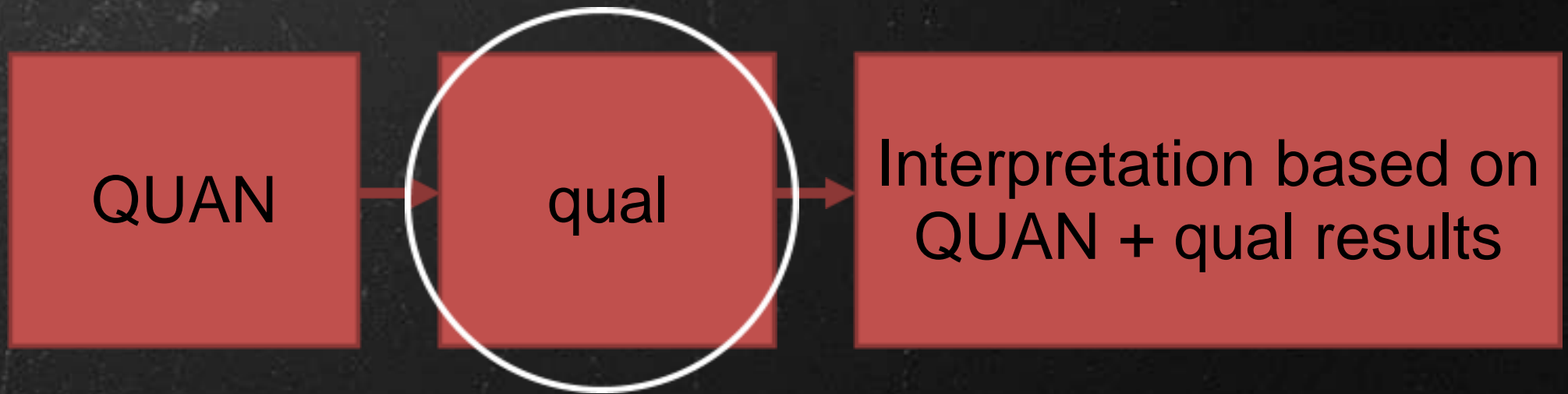
students' perceptions of teacher feedback

$r(254) = .29, p < .001$

no differences between reflecting-nonreflecting on  
the content-specific test

significant correlation between posttest and student  
perceptions of teacher feedback

# Sequential Explanatory Design



# Qualitative Phase

Student interviews  
12 participants  
Purposeful sample

# Qualitative Results

Standardized open-ended

Follow-up questions  
67% to 100%

# Qualitative Results

## Overall View

"I just don't really worry about what we're trying to learn today. I just learn whatever is put in front of me"

"sometimes it helps you to understand it [lesson content] and read it... and then write it down, but sometimes I just want to write it down real quick without thinking about it"

"I just don't really worry about what we're trying to learn today. I just learn whatever is put in front of me"

Why does this student feel this way?

Do you think other students feel this way?

# Qualitative Results

## Constructive Feedback

"[feedback] that agreed or that helped out a bit... how the feedback kind of gives more on the subject... [or] helps you know where you need to focus and improve"

"like when she points out what you did wrong so you can work on it"

"good criticism that you're getting, like to help you out"

# Qualitative Results

## Self-Expression

"I kind of liked the drawings as long as you could put your own thoughts"

"[illustrating a reflection] let us be creative and draw"

"we like writing in our journals because sometimes you have activities like writing a letter to your parents pretending you are a logger"

What kind of assessments opportunities would permit student self-expression in  
math,  
reading,  
writing,  
science,  
social studies,  
health,  
and so on?

# Qualitative Results

## Fluency

"well, when you successfully learn something it won't go away, you remember it..."

"like when you understand it all, what you're learning about when you don't really have to think, that you just have it right in mind"

Why memory?



# Uncommon Comments

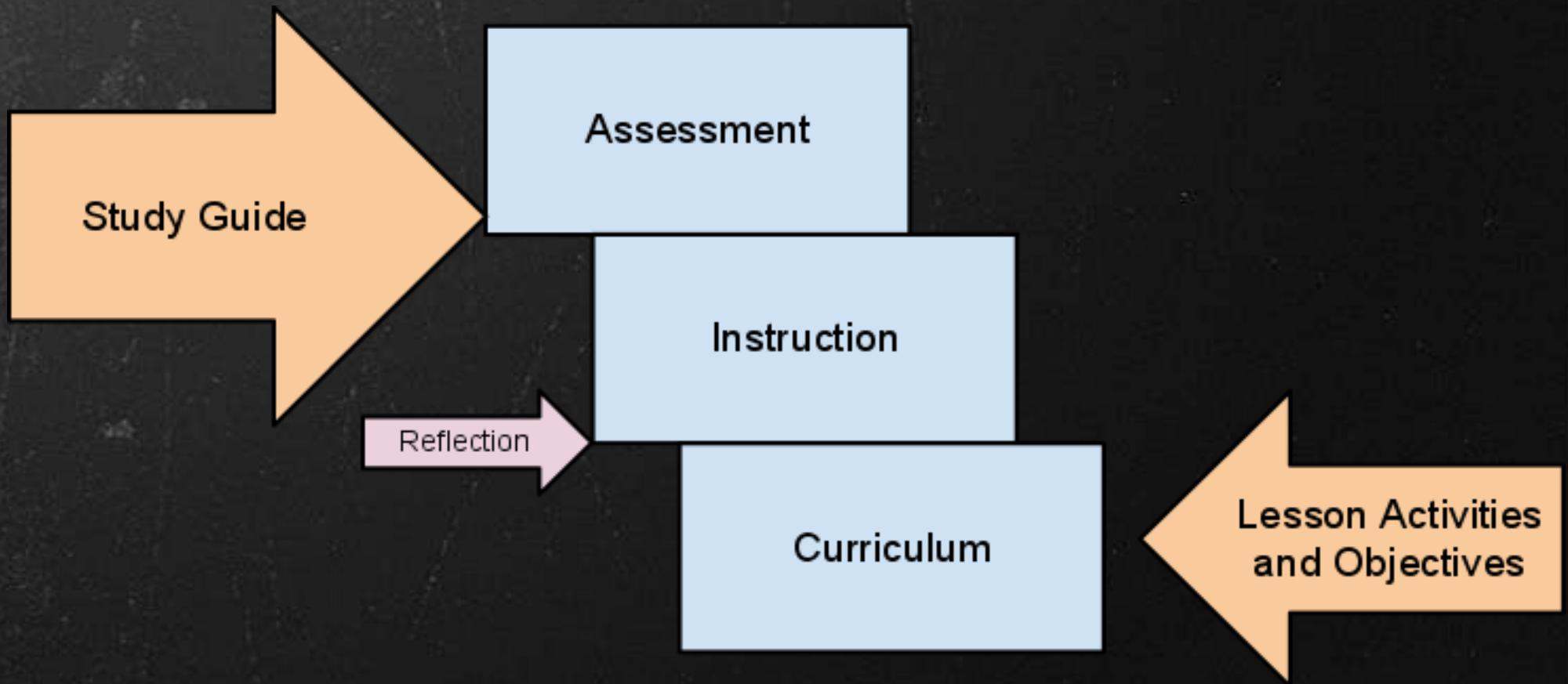
"I think you can't be too sure whether you have learned something like totally.... I don't think there is a way of knowing whether or not you've learned something... as long as you continue to be able to explain it... that's probably good enough"

"to me, if you know something really well you can define it... then you can express it without difficulty and you can take advantage of it."

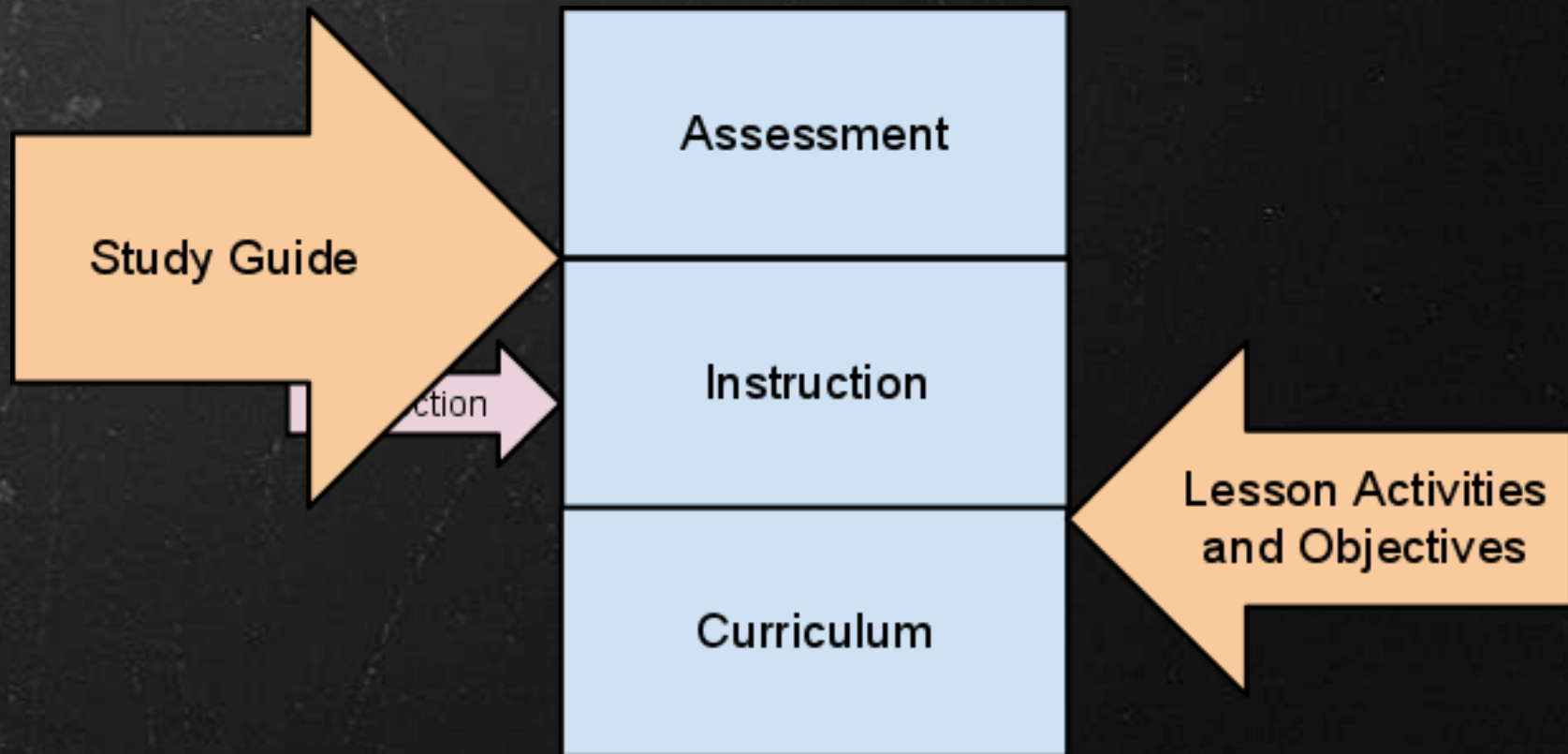
# One More Piece



# Extraneous Variable



# Extraneous Variable



Why not use the most effective instructional practice to produce optimal student performance on a specific assessment?

Assessment



Instruction

Curriculum

Lesson Activities  
and Objectives

Reflection

Study Guide

Metacognition  
Critical Thinking  
Problem Solving  
Social Skills



# Summary

Convergent production  
Alternative outcomes

# Solar Suitcase Article



# Convergent Production

Broad search  
Open problem  
Generate alternatives



"The things that have made a difference for our country are freedom and the encouragement of creativity, imagination and innovation - things that are not encouraged by our obsession with standardized testing"

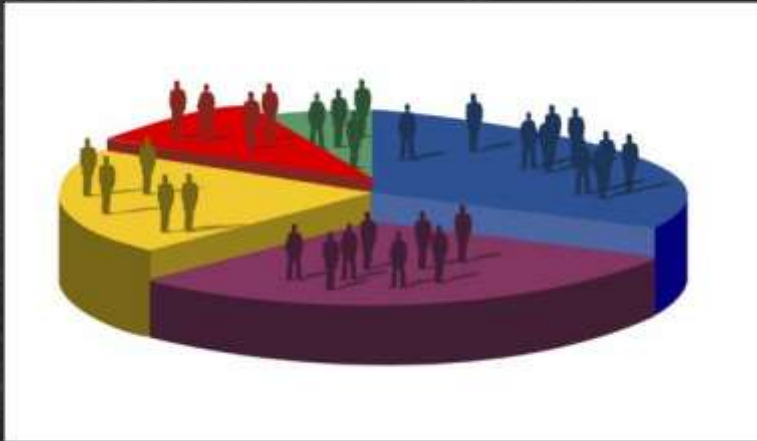
~ Ravitch and Dodge (2011), p. 55

What are your thoughts on this quote?  
What kind of assessment promotes creativity, imagination, and innovation?

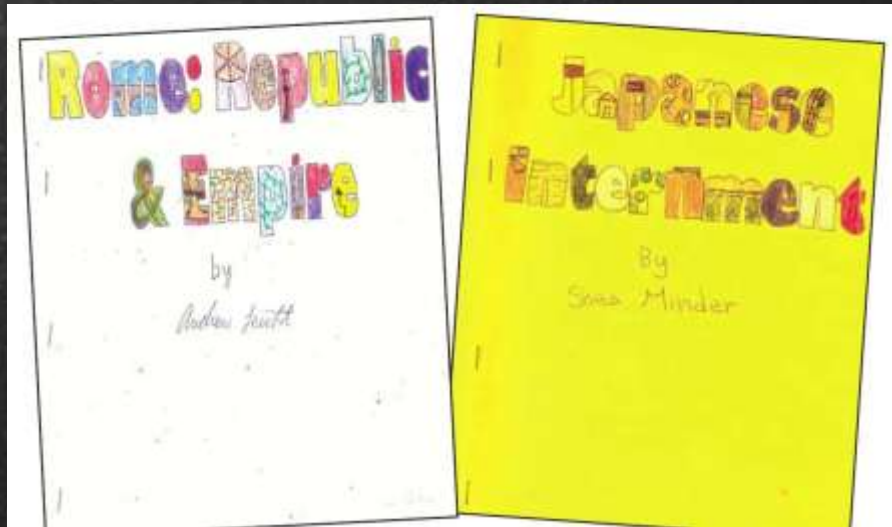
# Second Research Study

# Participants

113 students 59 female  
1% African American 2%  
American Indian  
11% Asian American 77%  
European American 9% Latino  
American  
32% free/reduced



# Intervention



23 days  
5 minutes - 50 minute class  
Reflections  
Journal  
Prompt  
Teacher feedback  
Peer check

# Research Questions

1. Achievement
2. Open and closed writing prompts
3. Perceptions of creativity and real-world problem identification

# Example Prompts

Open prompt

*Today I learned...*

Learning illustrated

Closed prompt

What does *mechanization* mean?

What are the three steps for analyzing an artifact?

# Summary

## Alignment

113 7th grade students

5 classrooms

Social studies

23-day intervention

Characteristics of reflective thinking

Content-test and questionnaire

No study guide

# Design

Pretest-posttest  
Content-specific test

Questionnaire  
Eight items

Three conditions  
Randomly assigned



QUAN

# Example Items

## Content-specific test

Student

6.

Evidence is

- A video or picture that an event is right
- Something used in court by a lawyer
- A sign or proof of something that is true
- Something that makes the event true

2.

Reflecting gives me a chance to express my thoughts and ideas.

1 2 3 4 5

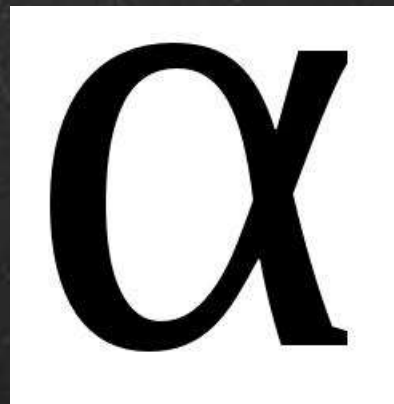
Strongly Agree      Strongly Disagree

# Test and Questionnaire Reliability

Reliability

Content-specific test

Pretest .60 Posttest .79

A large, bold, black Greek letter alpha symbol ( $\alpha$ ) is centered within a white square. The symbol is rendered in a serif font.

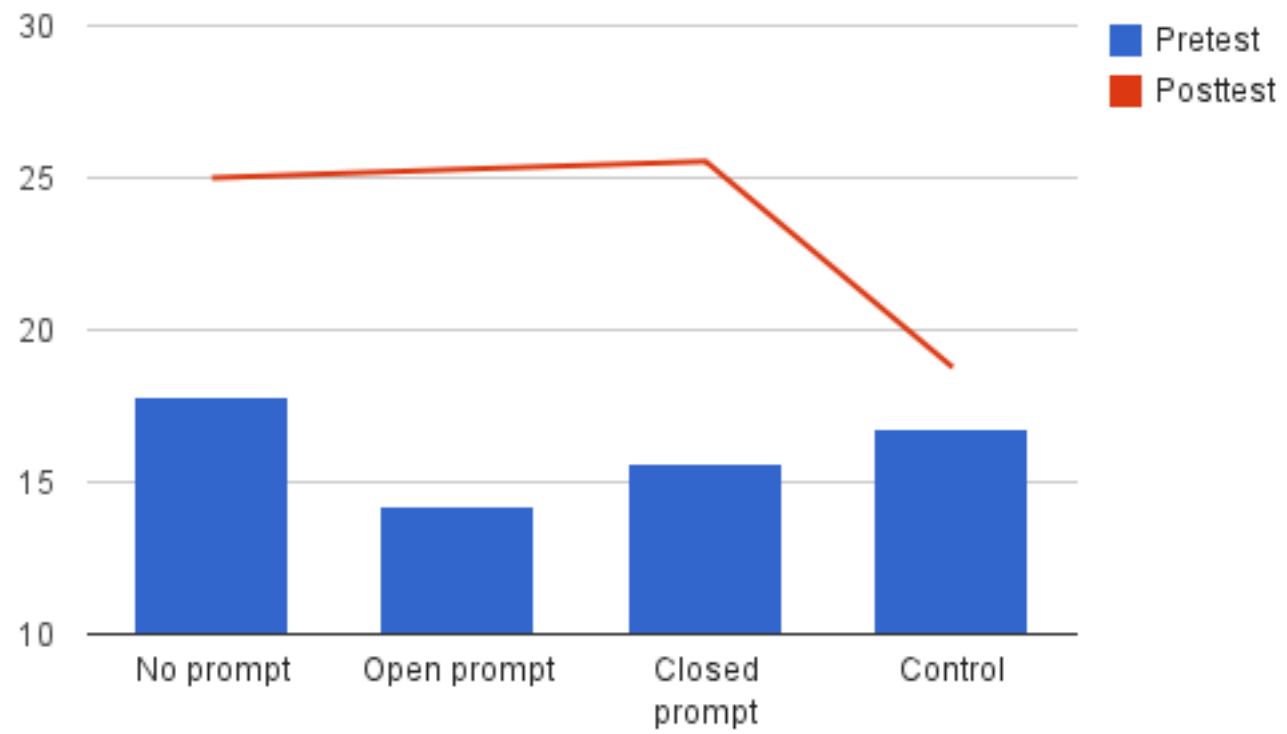
Student questionnaire

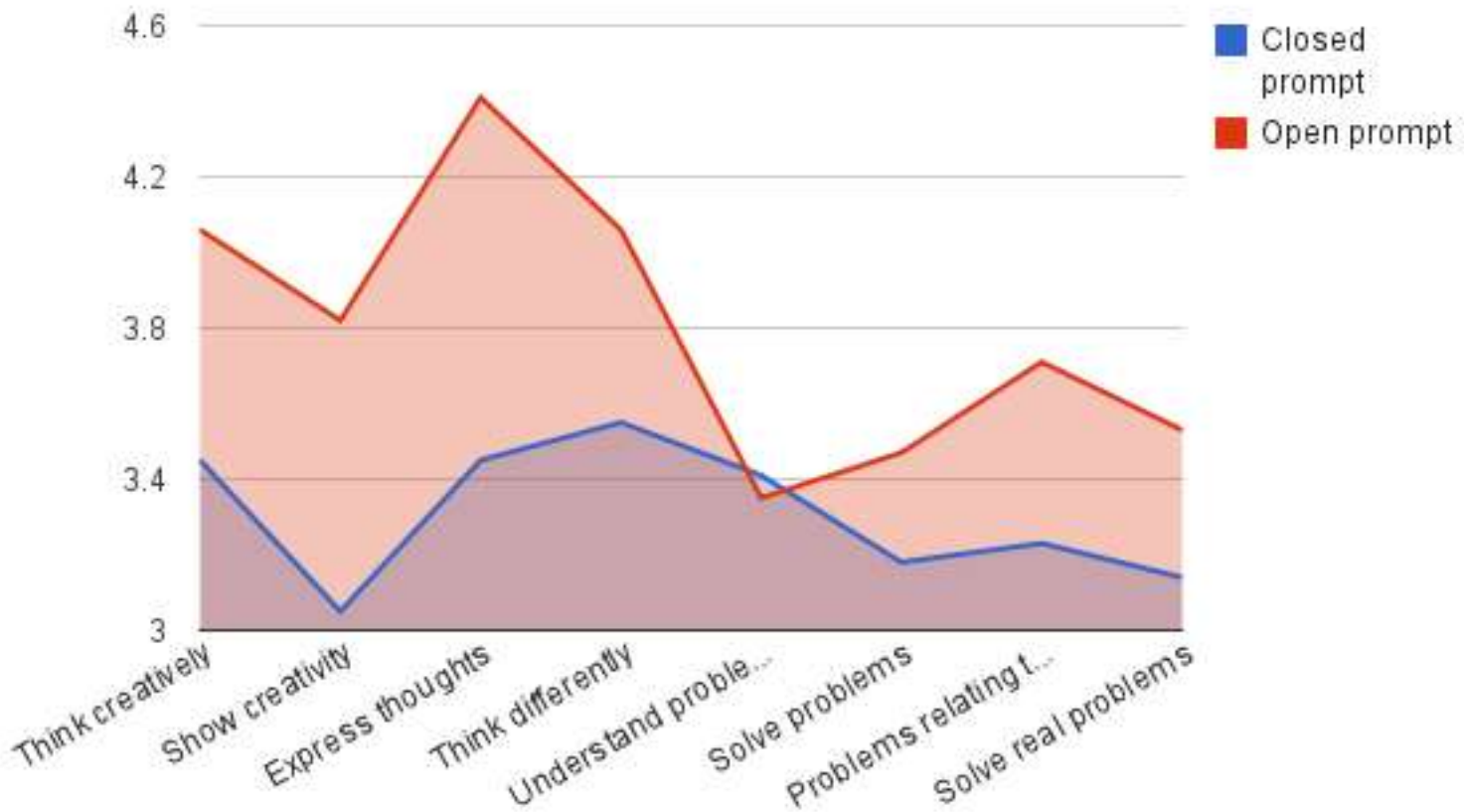
Posttest .85

# Designation

## Class Time

8:00 a.m.	No prompt
8:56 a.m.	Control
9:46 a.m.	Open prompt
12:45 p.m.	Closed prompt
1:40 p.m.	Control





# Results

Content-specific test

No reflection versus reflection,  $p = .02$

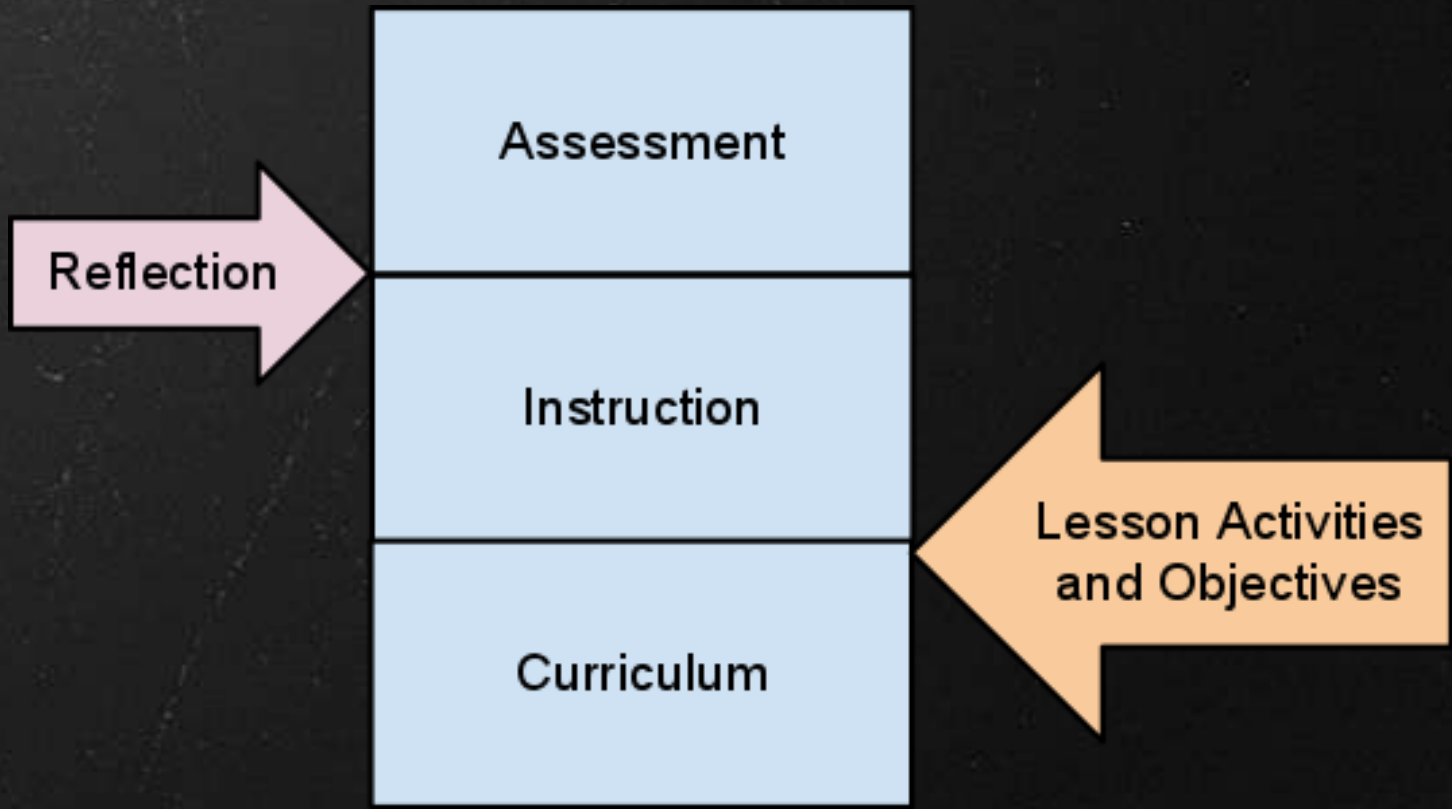
Student questionnaire

Sense of creativity:

No reflection versus reflection,  $p < .03$

Problem identification: No reflection versus reflection,  $p < .03$

# Variable



Lesson Activities  
and Objectives

The diagram features a black background with a yellow border. Two arrows point from the left towards a yellow circle on the right. The top arrow is orange and contains the text 'Lesson Activities and Objectives'. The bottom arrow is light purple and contains the text 'Reflection'. The yellow circle on the right contains the text 'Sense of Creativity'. A horizontal blue line is positioned below the circle.

Reflection

Sense of  
Creativity

---

# Limitations

Teacher effects  
Experimenter effects  
Student selection  
Intervention fidelity

# Additional Research

## Method

103 psychology students (83 female)

Pretest - video lecture - intervention - posttest

Five conditions, participants randomly assigned

~ Nuckles et al. (2009)

# Additional Research

## Prompts

Which are the main points in your opinion?

What possibilities do I have to overcome my comprehension problems?

Which main points have I already understood well?

Which main points haven't I understood yet?

How does assessment stimulate learning?

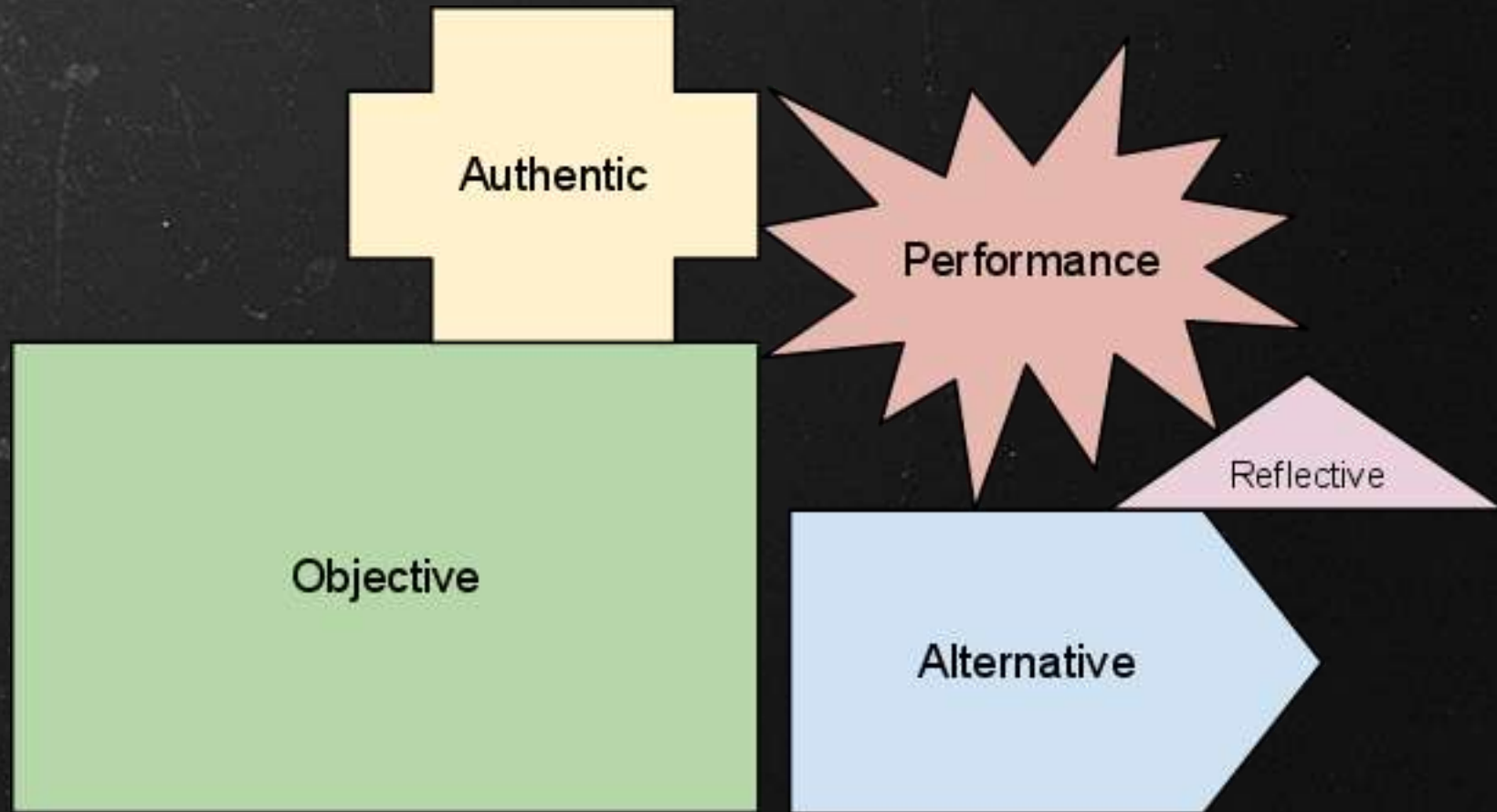
Does Washington's assessment system integrate convergent and divergent production?

What would an assessment look like which called for a "planning for remediation" component?

Do the tests we make "prompt" self-regulation, e.g. skills associated with organizing, remediating, monitoring, and planning?

# Balance

## Convergent Production and Divergent Production



# Practice

Problem-based learning

Lesson question

Ongoing formative assessment opportunities

- I learned
- Learning illustrated
- Think aloud
- Pair share
- Pyramid discussion

Link between cognitive and other outcomes

# Past Example

"Can you tell me, Socrates, whether virtue is acquired by teaching or by practice; or if neither by teaching nor practice, then whether it comes to man by nature, or in what other way?"

Definitions

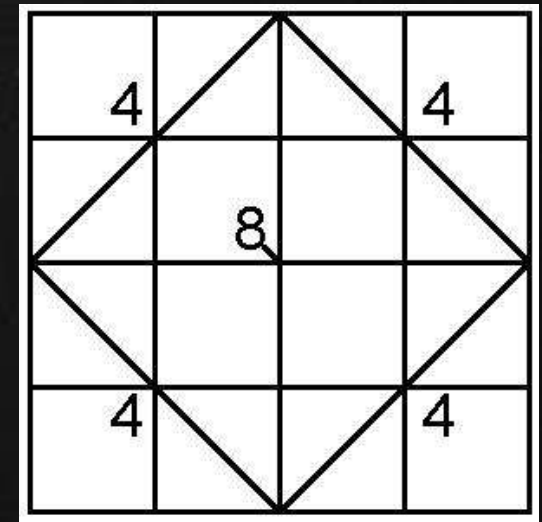
Comparisons

Examples

Morality

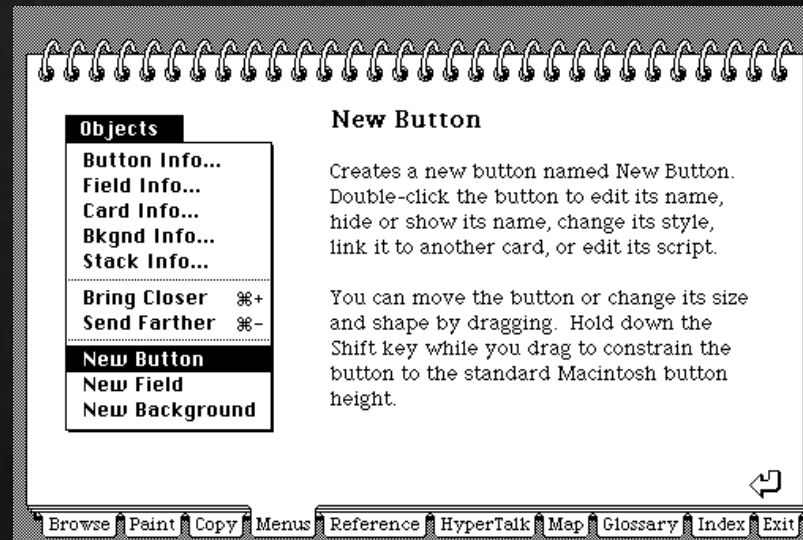
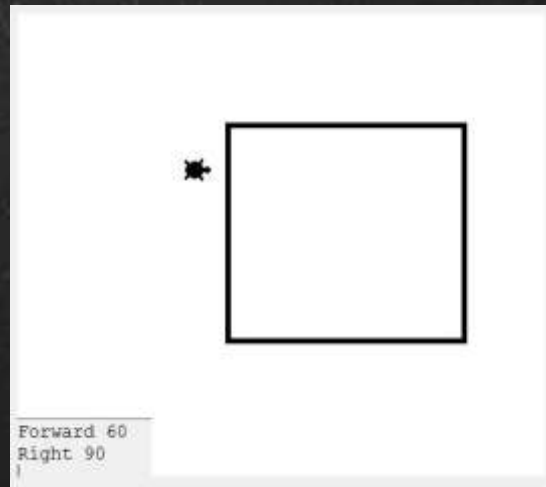
Mathematics

Validity



# Modern Example

## Logo Oregon Trail Hypercard



# Reflective Assessment

I learned....

I think....

I feel....

I wonder....

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