# What Works in Curriculum for the Gifted: 25 Years of Research

The Chinese University of Hong Kong
February 23, 2017

Joyce VanTassel-Baska, Ed.D.
Smith Professor Emerita and Founding Director, Center for Gifted Education
The College of William and Mary

# How People Learn

- New knowledge is constructed  based on existing conceptions and beliefs.
- Usable knowledge is connected and organized around important concepts that support transfer of learning.
- The use of deliberate learning strategies to scaffold instruction.

---National Research Council, 2000

# Theoretical Frameworks for William & Mary Curriculum

- Cognitive learning (e.g. Sternberg)
- Social reconstruction (e.g. Banks)
- Zone of proximal development (flow)
  - (e.g. Vgotsky, Csikszentmihalyi)
- Academic rationalism (e.g. Adler)
- Constructivism (e.g. Vgotsky)

# Central Research Questions

- What differentiated interventions in curriculum, instruction and assessment work with gifted learners at key stages of development in the core domains of learning?
- How effective is gifted curriculum with promising low income and minority students ?
- How do teachers change instructional practices based on using a differentiated curriculum and receiving targeted professional development?
- What are the factors that impact successful innovation in schools?

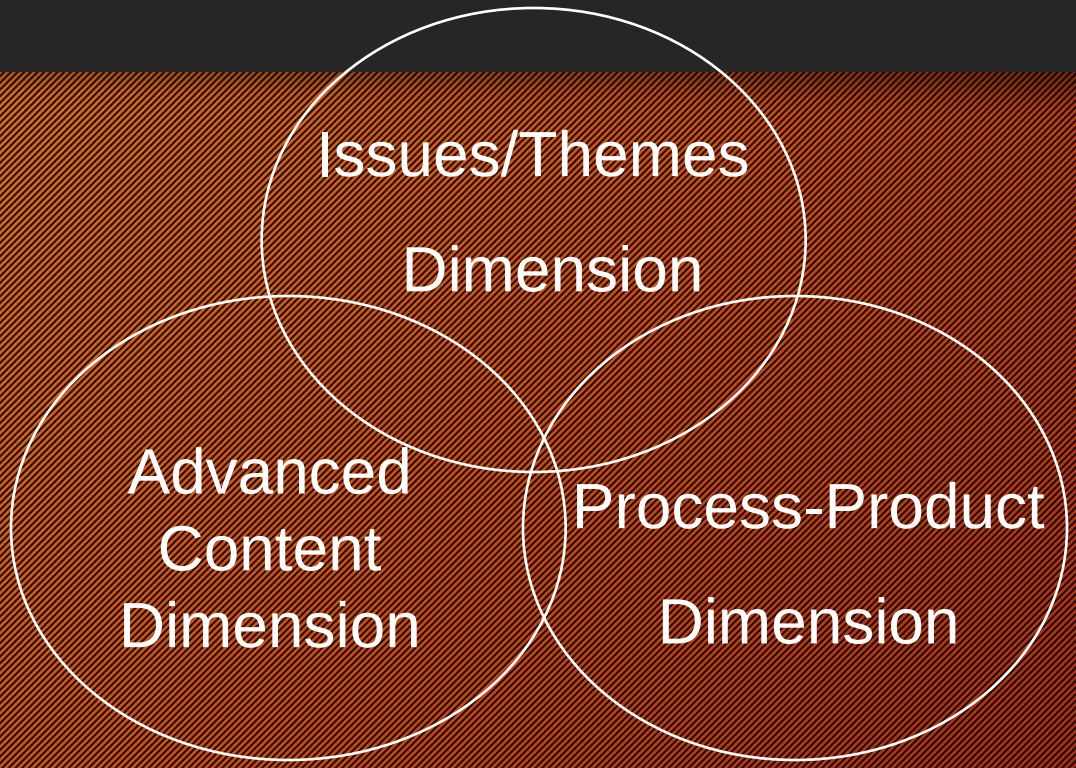
# Methodology

- Quasi-experimental designs
- Experimental designs
  - (Project Athena & Clarion)
- Qualitative (case studies of schools)

# Learner Characteristics and Corresponding Emphases in the Curriculum

| THE LEARNER | | THE CURRICULUM |
| --- | --- | --- |
| Precocity | → | Advanced Content |
| Intensity | → | Process/product depth considerations |
| Complexity | → | Issues/concepts/themes/ ideas across domains of learning |

# The Integrated Curriculum Model




VanTassel-Baska, 1986

# Advanced Content Dimension

- Teaching subject matter earlier to gifted students
- Pre-testing for  proficiency and aptitude
- Teaching the curriculum at an accelerated pace

VanTassel-Baska (2004).

# Application: Accelerated Learning

Talent Search Model research:

- Testing elementary and middle school students on a verbal aptitude measure and offering follow-up fast-paced classes in selected languages.
- Assessment results suggest that younger students score at the mean or higher than older students taking the same curriculum at a regular pace.
- Online and independent learning opportunities available for self-pacing of curriculum through various media.

--Stanley, Brody, Olszewski-Kubilius, et al., (1982-2012)

# Process-Product Dimension

- **Curriculum diffeentiation requires higher-order skills of analysis, synthesis and evaluation.**
- **Learning must engage the learner in problem-finding and problem-solving behaviors**
- **Engaging students in constructing and designing artifacts representative of a chosen language's culture(s) deepens interest and motivation.**

# Application: Higher Level Processes

- --Use of scaffolds to elevate thinking
- --Models for problem solving
- --Questioning

**What literary allusions does Shakespeare use and why?**

**Synthesize the Hamlet "To be or not to be" speech in your own words.**

**Evaluate the impact of Shakespeare 's writing on our society today?**

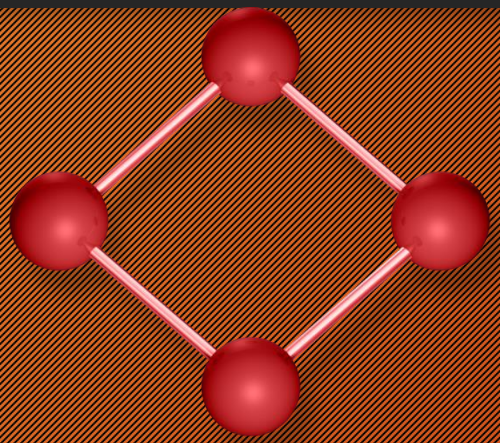
# Issues/Themes Dimension

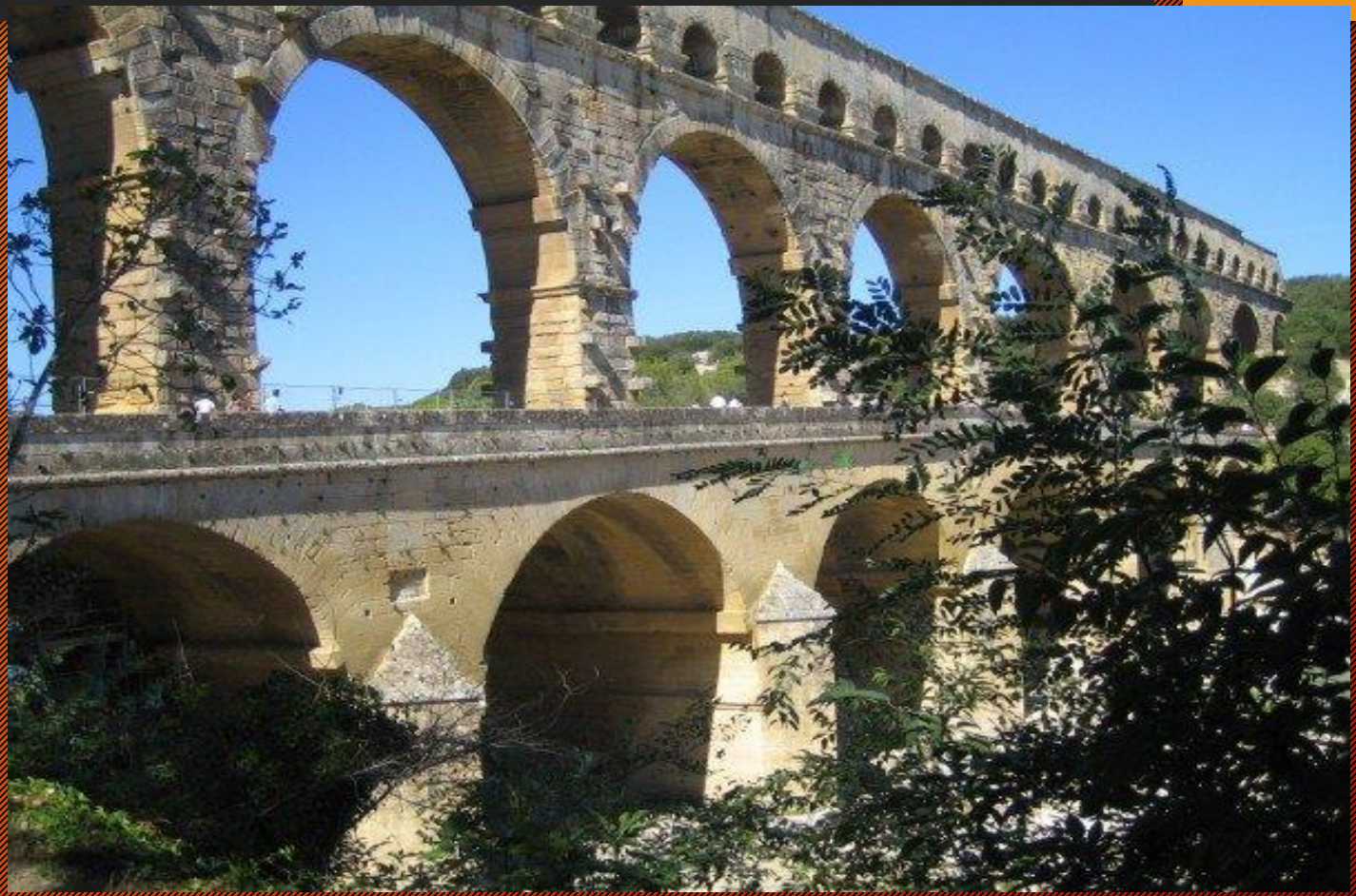
- **The use of concepts and themes elevates learning for the gifted to more abstract levels for making easy interdisciplinary connections.**
- **Real-world issues and problems provide a level of complexity that challenges gifted learners to think in creative and innovative ways.**
- **Concepts, themes and issues cut across social-cultural boundaries, providing universal ways for students to appreciate the connectivity of learning as a window to humanity.**

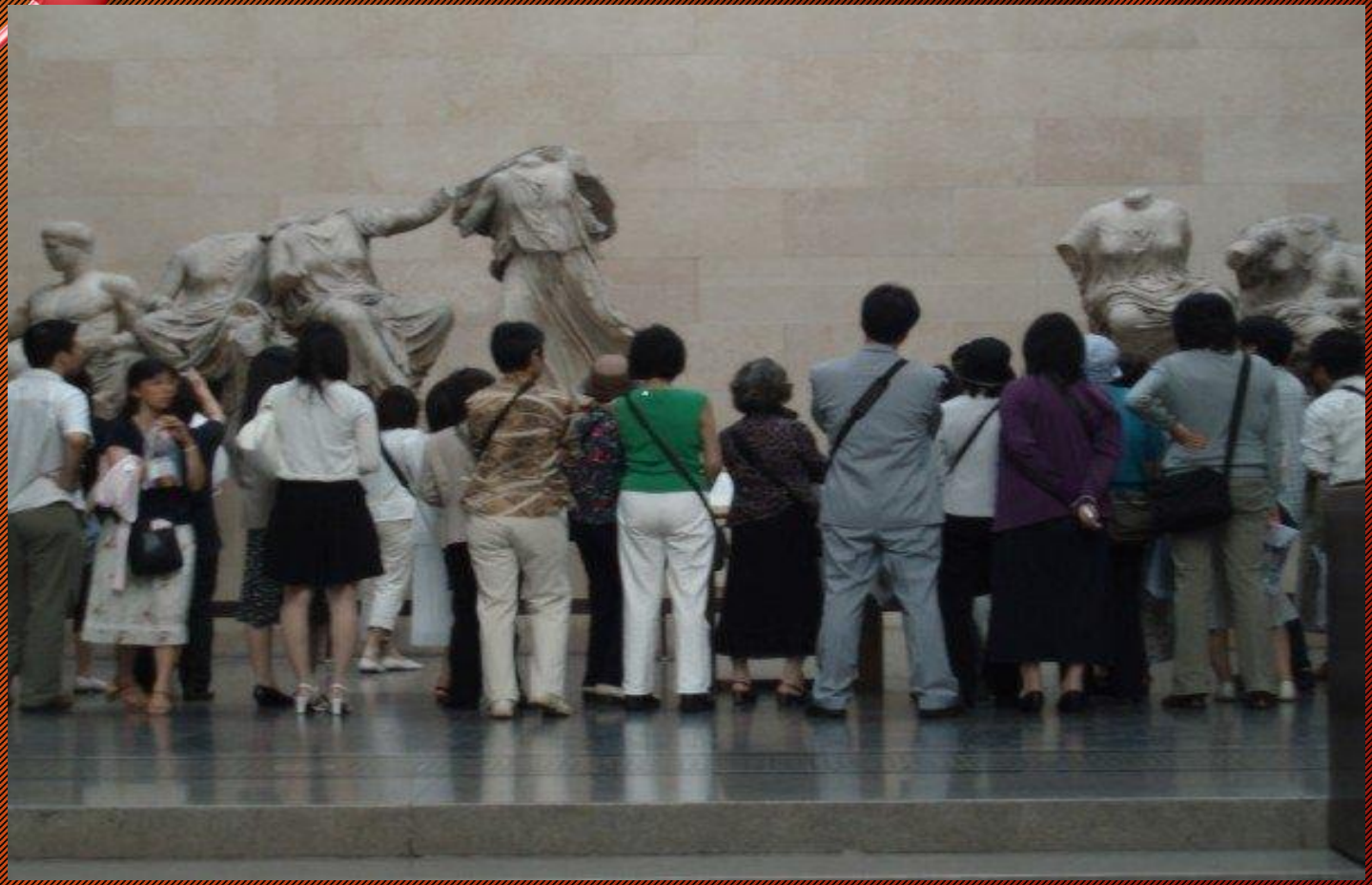
# Application: Concepts for Interdisciplinary Study

- **Systems** – study of systems in all areas of learning—scientific, social, mathematical, language
- **Change**– allows for study of the world in respect to how change impacts our understanding
- **Models** – representations of reality in abstract form

# MAKE CONNECTIONS





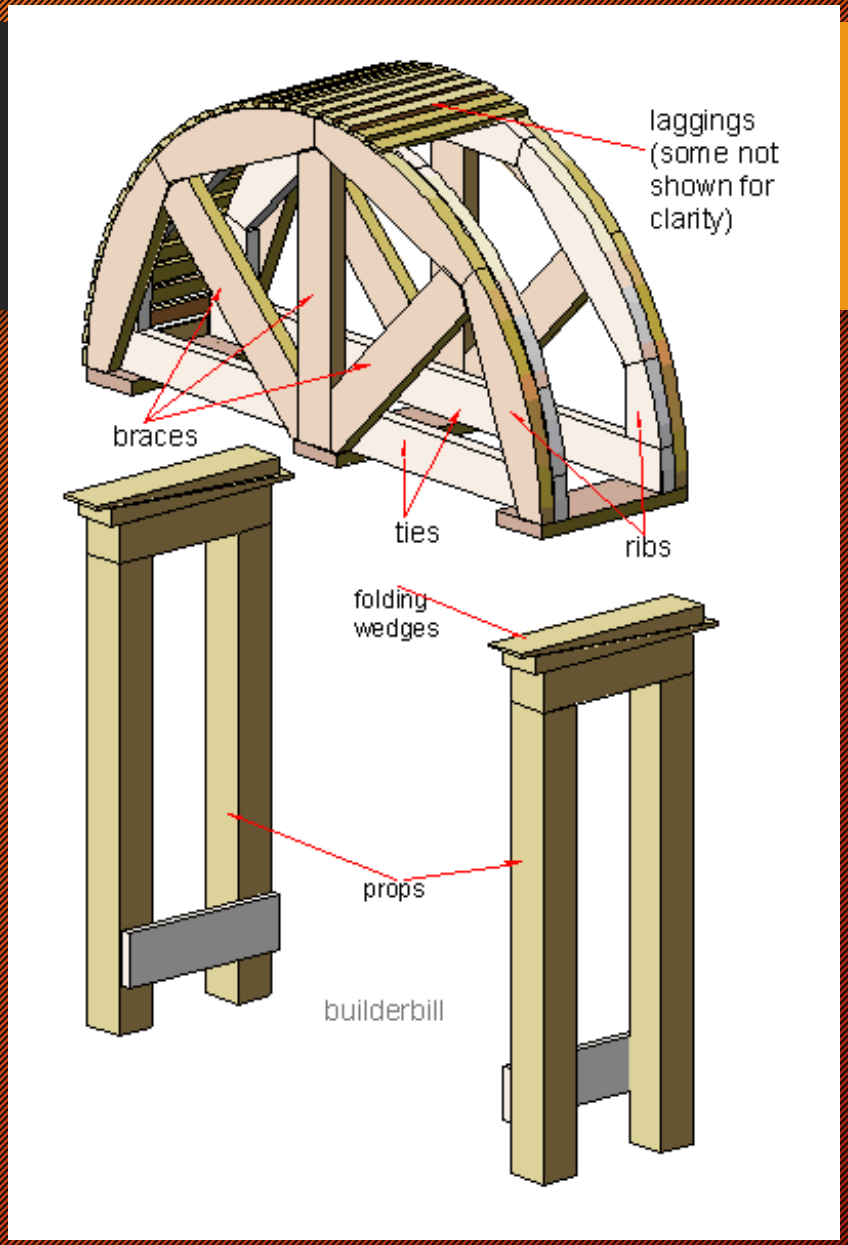


# Assessment

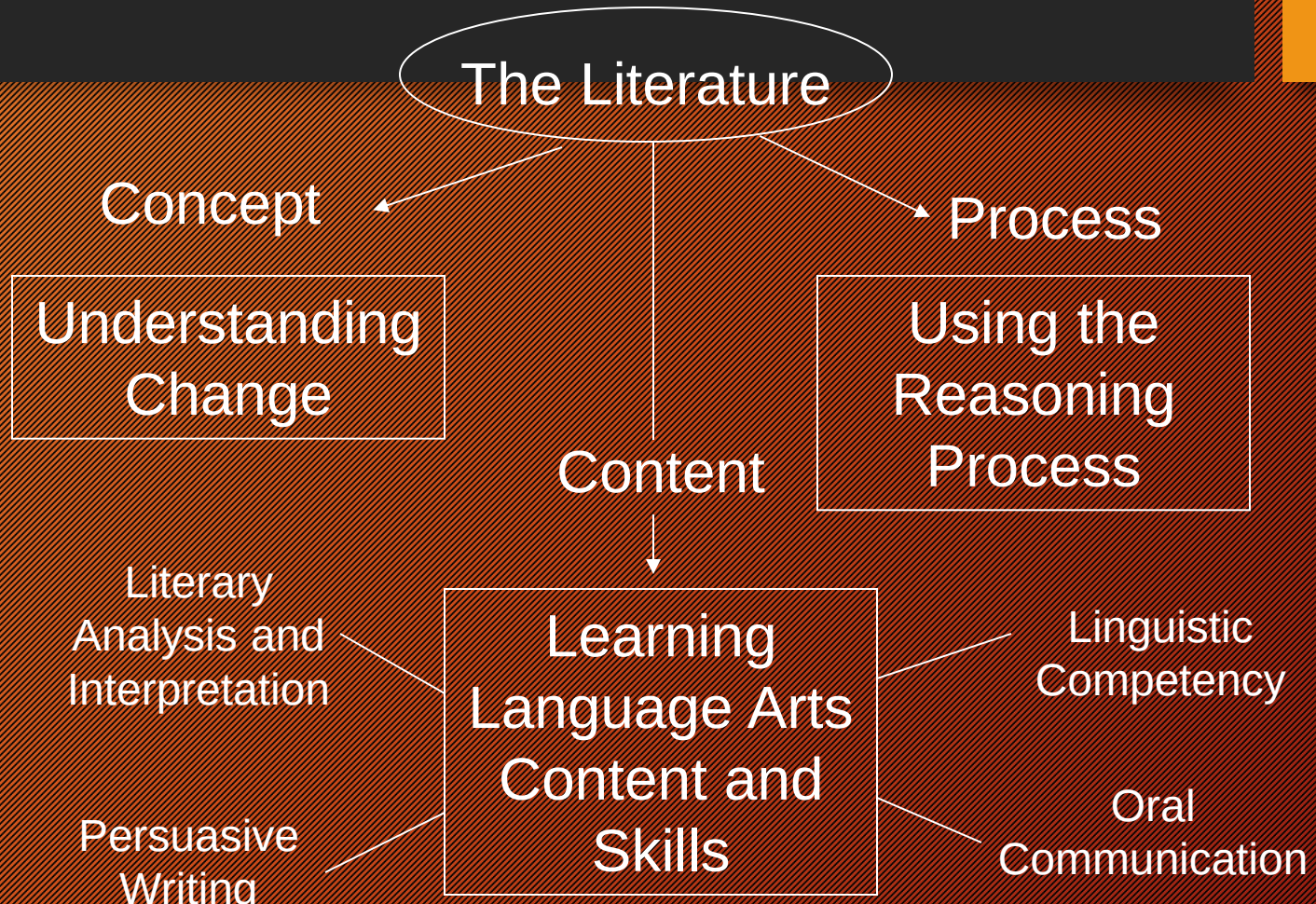
- Product-based, using specific rubrics.
- Concept-based, asking students to participate in discussions and write essays on the concept of time.
- Content-based, vocabulary and oral proficiency assessments.

**Create an arch, using mathematical and engineering skills and specifications provided.**

**What is the significance of the arch as a design structure? Why?**



# Language Arts Curriculum Framework



# Major Research Findings from Quasi-Experimental Studies in Language Arts

- Significant and important treatment effects for literary analysis and interpretation and for persuasive writing
- No significant gender effects
- Student performance showed that additional attention was needed to enhance higher-level thinking and elaboration skills.
- Students were able to improve significantly after unit instruction regardless of the grouping model employed.
- Students enhanced their learning each time they were exposed to the units and maintained their level of achievement between interventions across the years.

Feng, VanTassel-Baska, Quek, Bai, & O'Neill,2004;
VanTassel-Baska, Zuo, Avery, & Little, 2002;
VanTassel-Baska, Johnson, Hughes, & Boyce, 1996

# Instrumentation for Project Athena

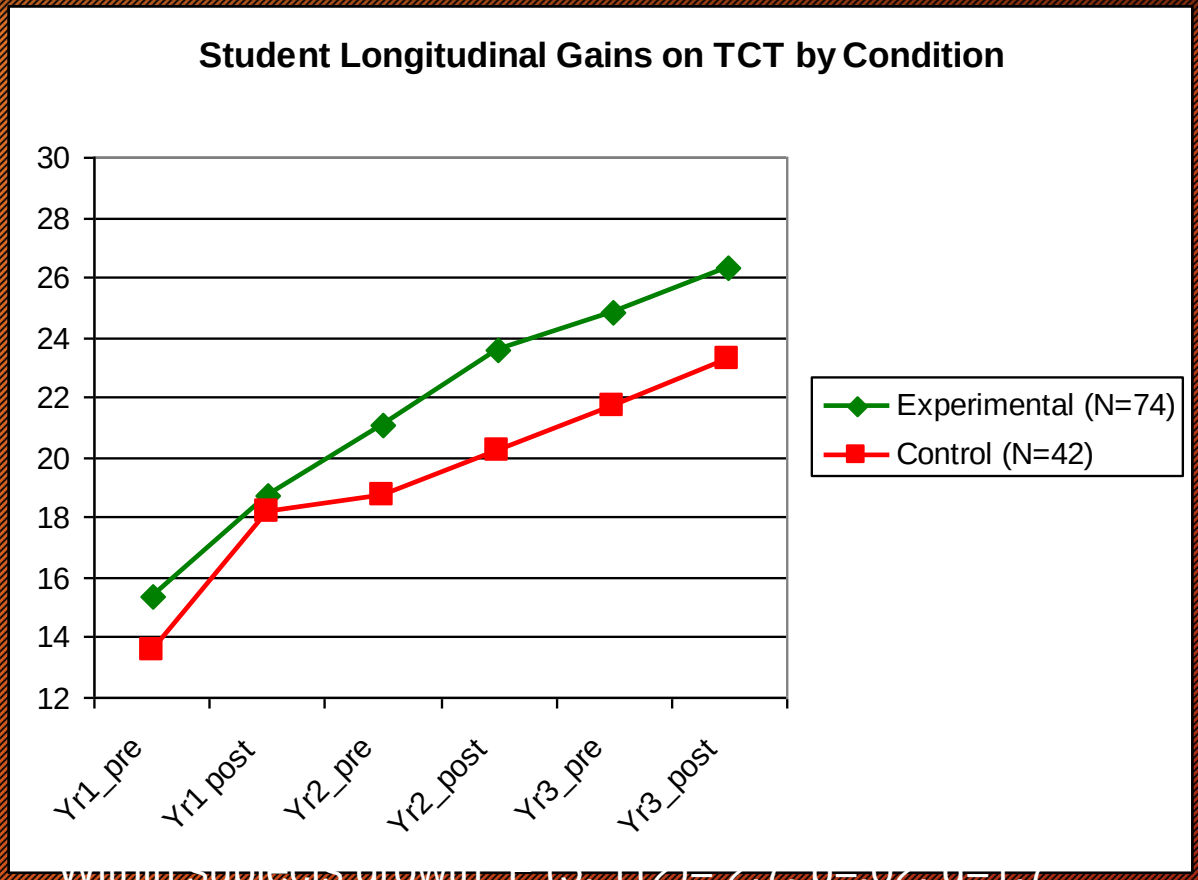
- Student Gains
  - Test of Critical Thinking (TCT) (r=.89)
  - Iowa Test of Basic Skills (Reading Comprehension)
  - Performance-based Unit Assessments
- Teacher Gains
  - Classroom Observation Scales- Revised
  - (COS-R)
    - r=.91-.93
    - Inter-rater reliability
      - .87-.89

# Project Athena (Language Arts) Longitudinal Experimental Findings in Title I Schools: Year 1 - 3

- Project Athena students showed significant learning gains in critical thinking and reading comprehension and outperformed control students in critical thinking. ($p<.04$) $d = .31-.56$
- Project Athena students showed consistent growth patterns in literary analysis and interpretation and persuasive writing at a level of significance and educational importance. $P<.000$ $d=1.0-1.75$
- Sub-analyses suggest that student growth in critical thinking may be bounded by the characteristics of the learner, teacher skills in critical thinking, and fidelity of curriculum implementation.
- Gender, ethnic, and ability differences were evident.
- Teacher observation data suggest that two years of training and implementation significantly enhances teacher behaviors in differentiation practices.

VanTassel-Baska & Bracken, 2005

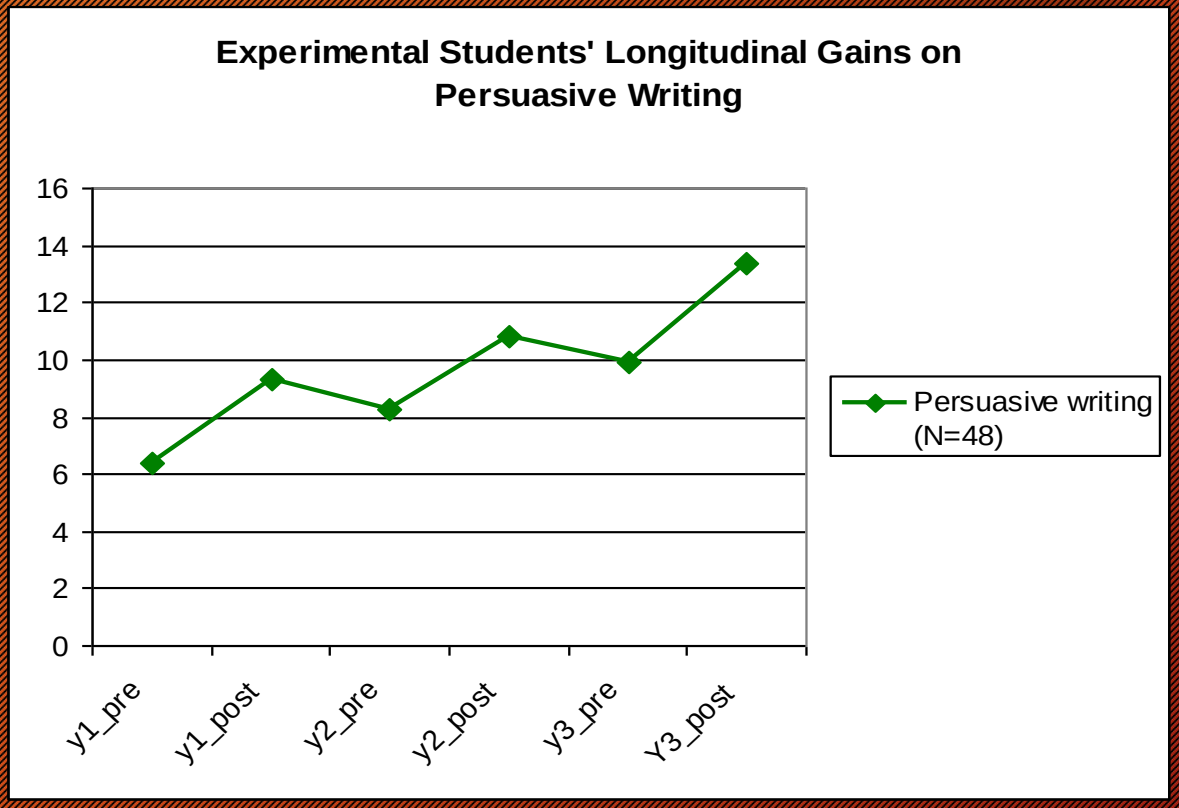
# Student Longitudinal Gains in Critical Thinking Skills




Within subjects growth: F (5, 112)= 2.7, p=.02, d=1.7

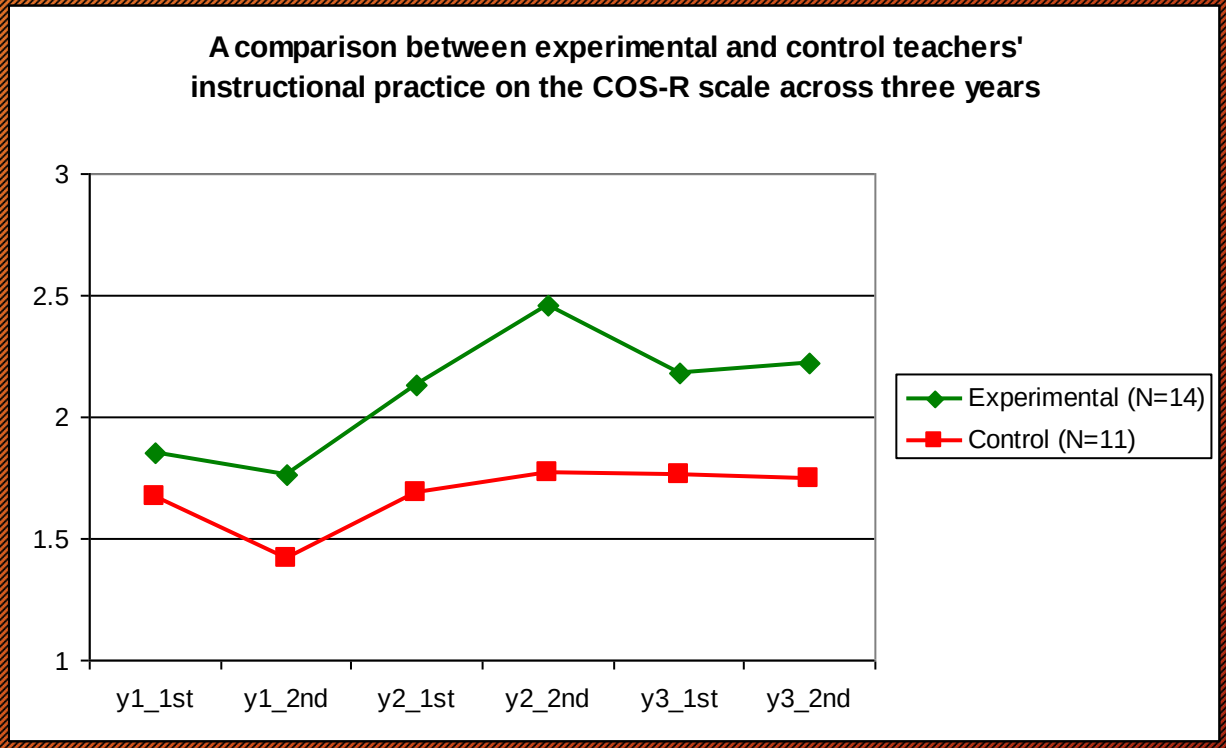
Between subjects effect: F (1, 112)=5.3, p=.04, d = .31-.56

# Experimental students' longitudinal gains on persuasive writing

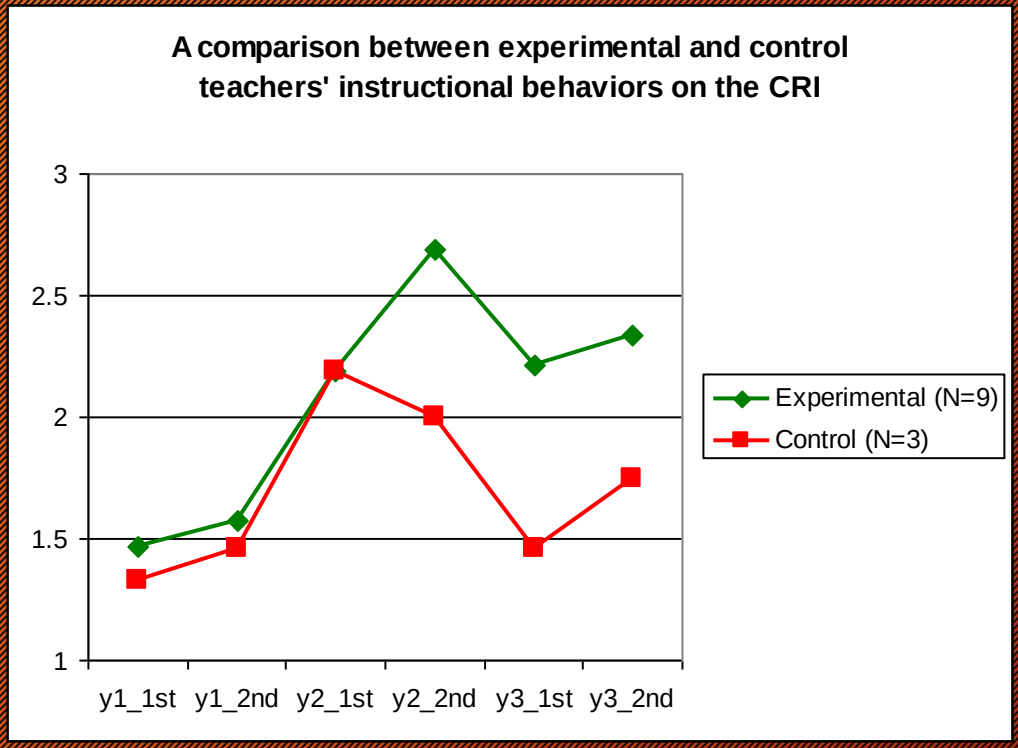



F (5, 46) = 15.6, p=.000, d = 1.75

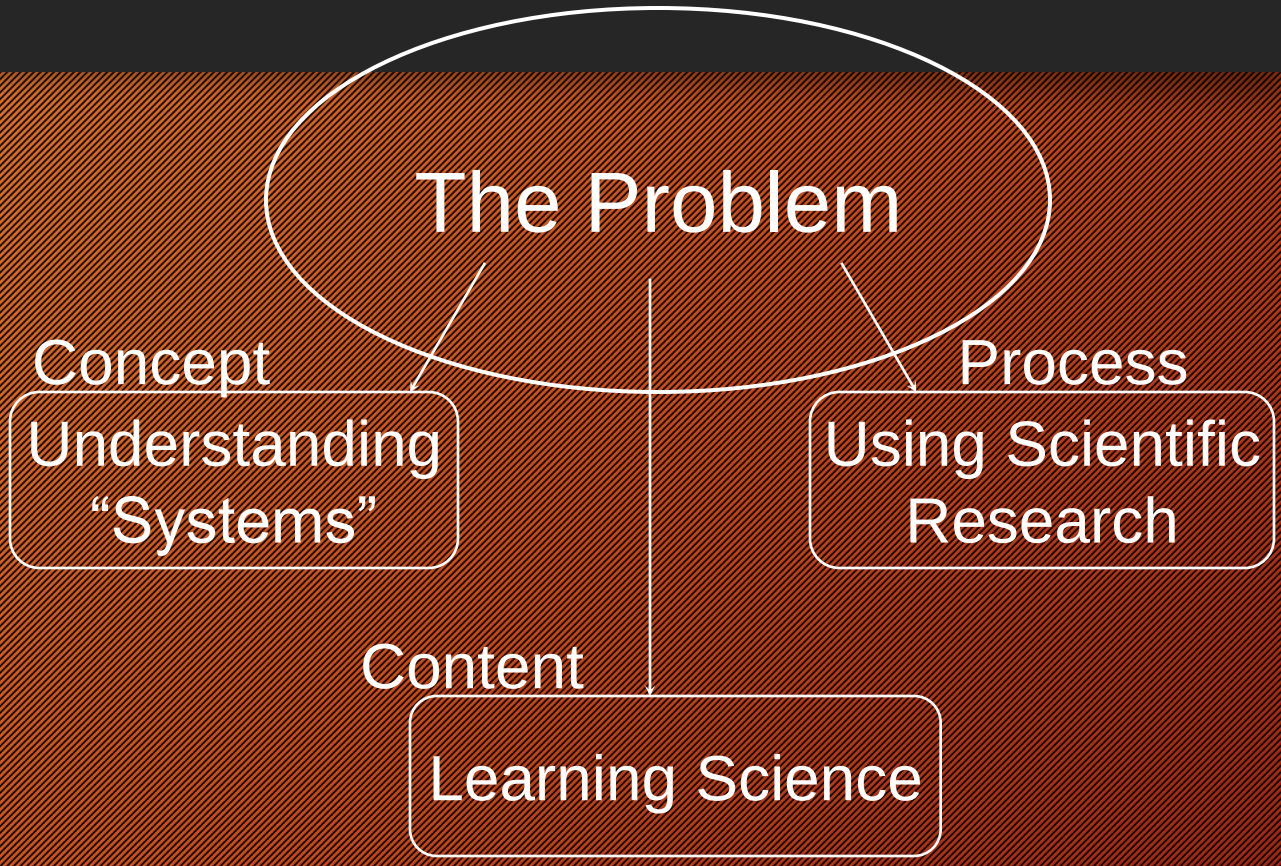
# A comparison between experimental and control teachers' instructional practice on the COS-R across three years



# A comparison between experimental and control teachers on the use of critical thinking strategies



# Science Curriculum Framework

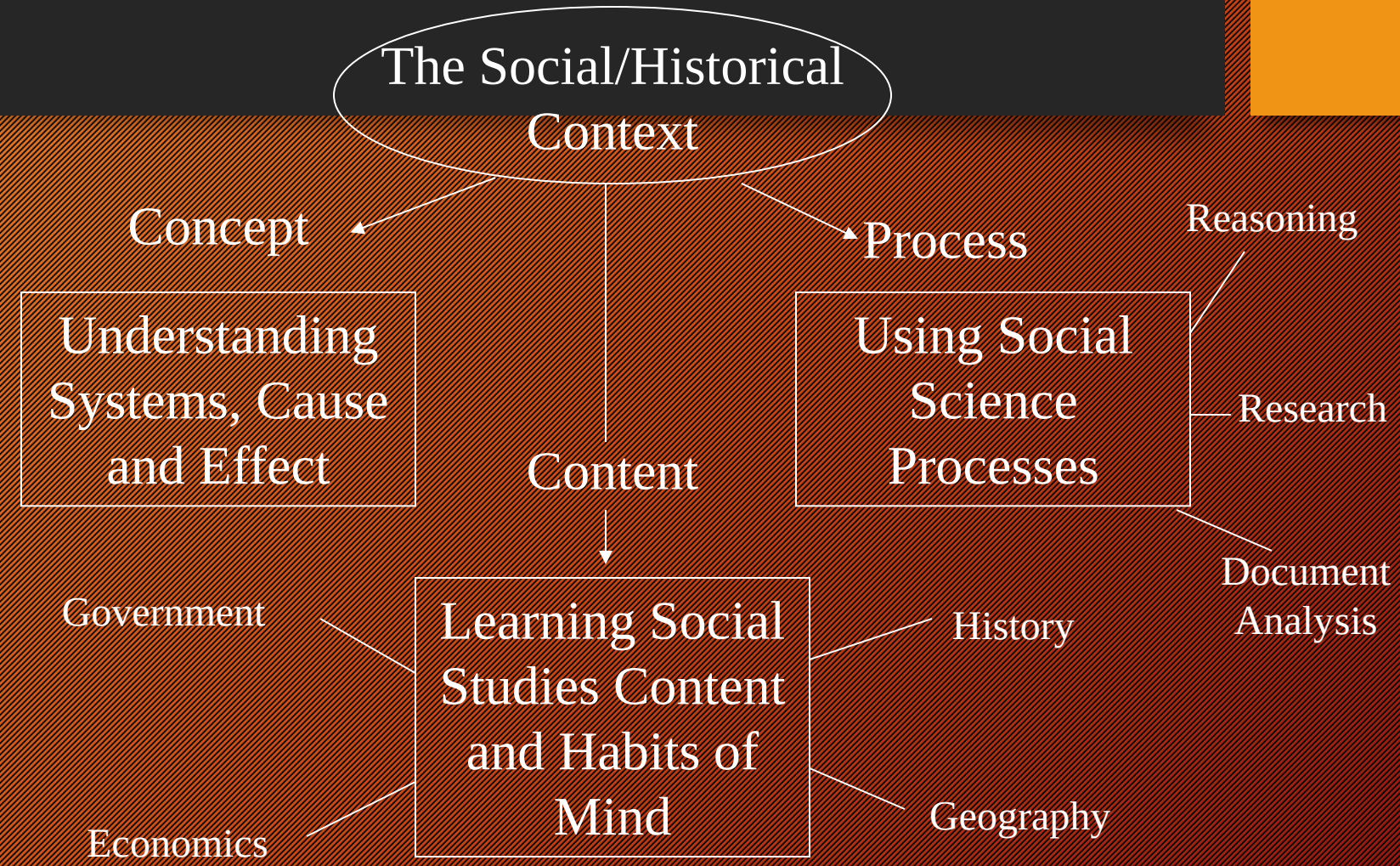


# Major Research Findings from Quasi-experimental Studies in Science

- Significant and important treatment effects were found for students' ability to plan an experiment based on use of the units.
- A similar pattern of effects was seen across units, grade levels, and grouping patterns.
- Responses to the units indicated high levels of engagement for both teachers and students.
- Repeated exposure to units over 2-3 year periods demonstrated increasing competence in the use of scientific experimentation.

Feng, VanTassel-Baska, Quek, Bai, & O'Neill, 2004
VanTassel-Baska, Avery, Little, & Hughes,2000
VanTassel-Baska, Bass, Ries, Poland, & Avery,1998

# Social Studies Curriculum Framework



# Major Research Findings from a Quasi-Experimental Study in Social Studies

- Students engaged in the units showed significant treatment effects on measures of conceptual thinking and content learning. Significant gains were also shown on measures of critical thinking.
- Treatment effect was evident for the whole sample and for nongifted students. Gifted students showed significant gains in content learning.
- Treatment effect was consistent for males and females.
- Subanalyses by school and by unit demonstrated significant treatment effect in content knowledge and critical thinking.
- Teachers who participated in the project over multiple years demonstrated increased use of strategies for accommodating individual differences, general teaching strategies, critical thinking, metacognition, and classroom extensions

Little, Feng, VanTassel-Baska, Rogers, & Avery,2002

# Models of Research-based Practice

- Using concept maps
- Articulation of thinking
- Promoting higher level thinking
- Making connections
- Using metacognition

# William & Mary Models for Teaching and Learning

- Concept Development Model
- Reasoning Model
- Research Model
- Problem-Based Learning
- Literature Web
- Hamburger Model
- Dagwood Model
- Vocabulary Web
- Analyzing Primary Sources
- Reasoning about a Situation or Event

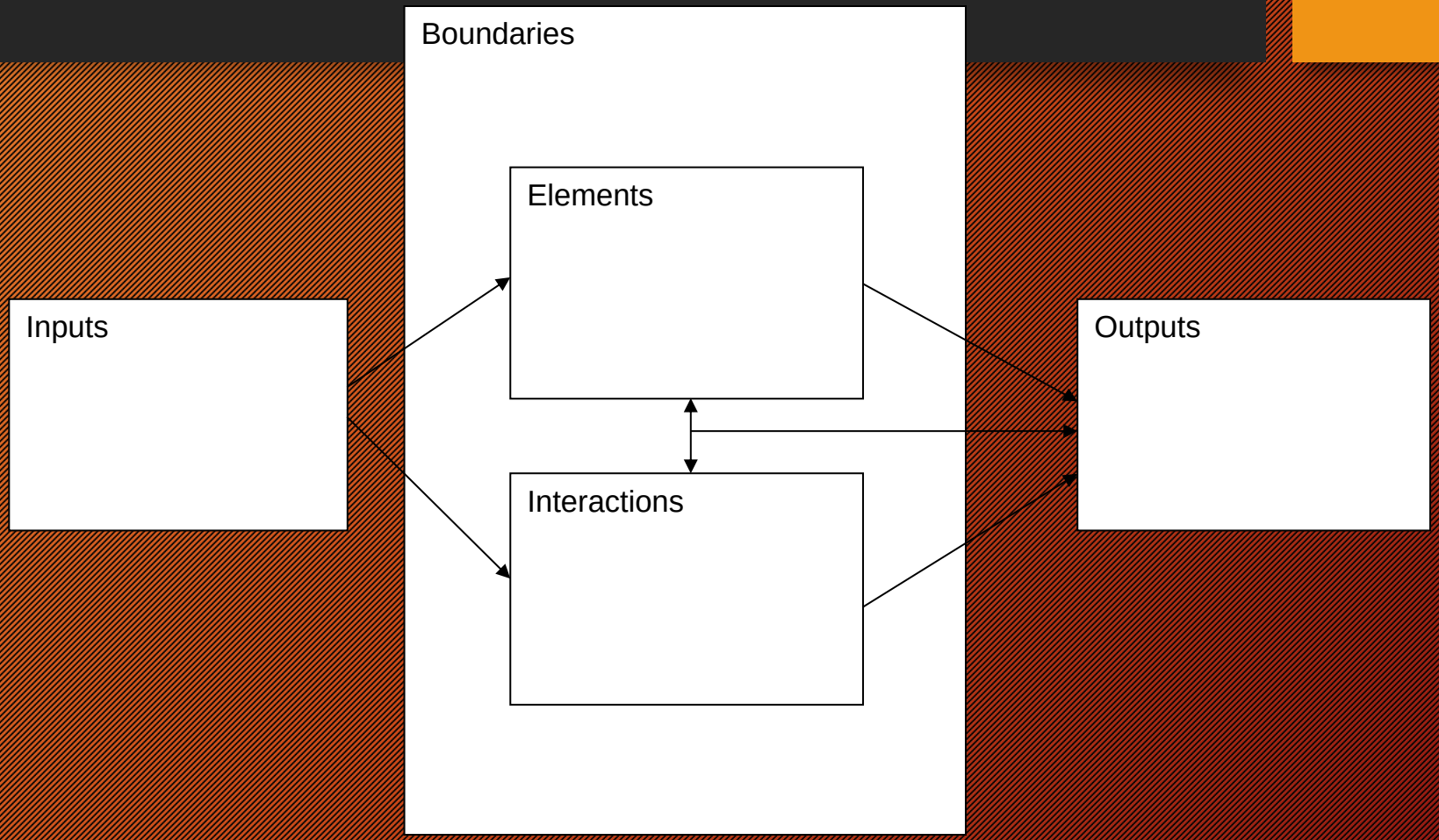
# Systems

**A system is a collection of items or processes that interact with each other to constitute a meaningful whole.**

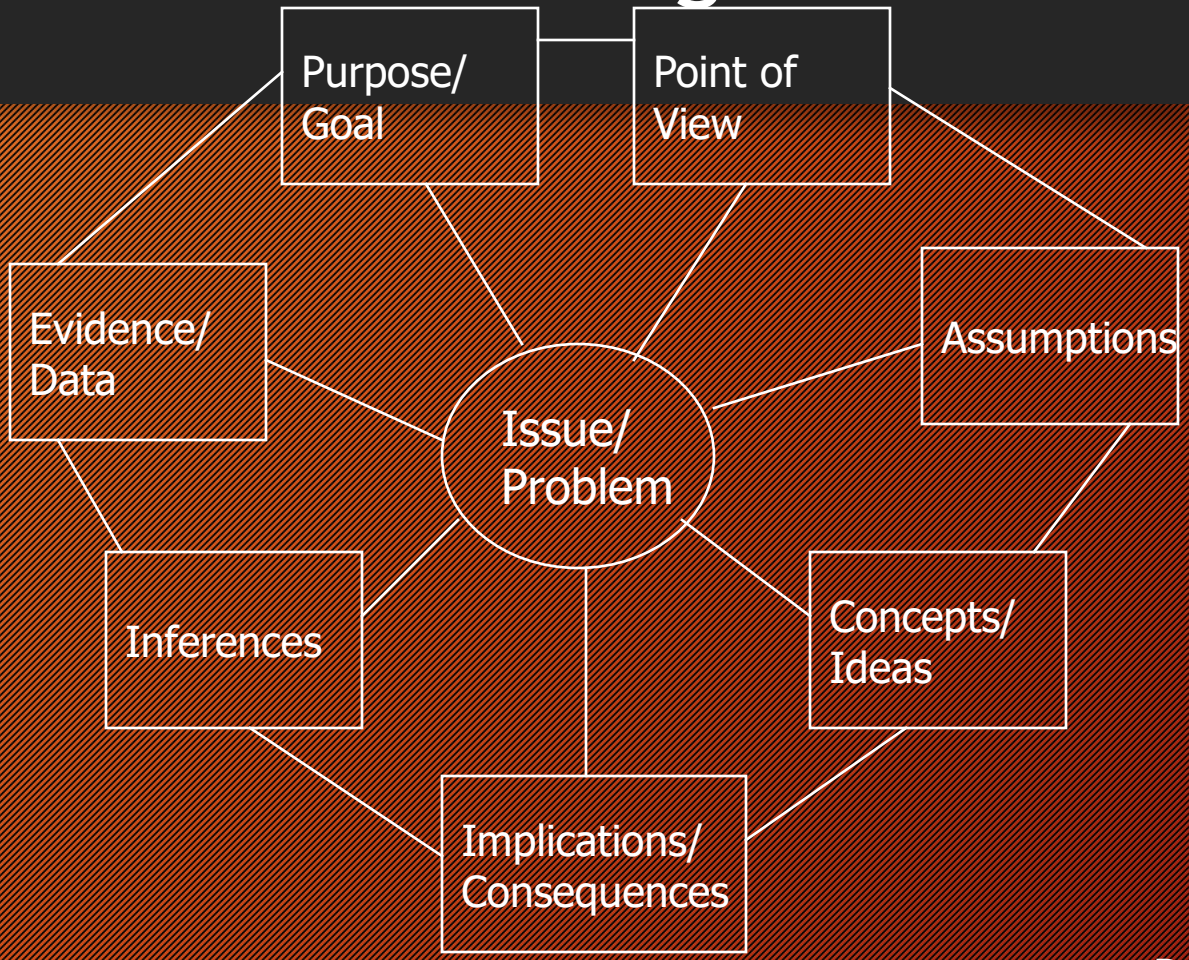
All systems have

1. Elements
2. Boundaries
3. Interactions among elements to generate system behavior
4. Many systems receive input and produce output

# Analyzing a System



# Elements of Reasoning

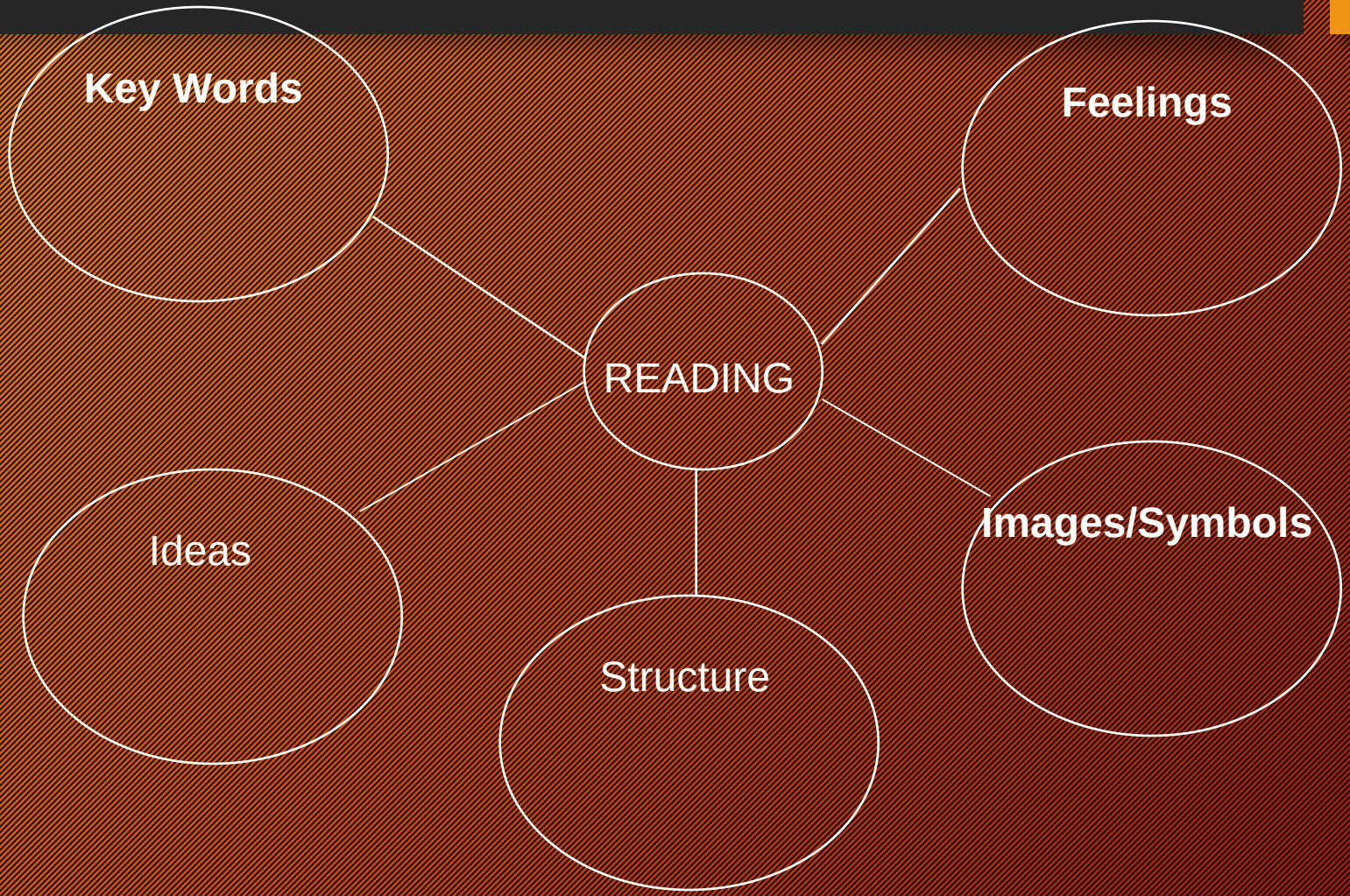



-- Paul, 1992

# Standards of Reasoning

- Are there *enough* reasons to make a convincing argument?
- Is the evidence *correct or right*?
- Are the reasons *clear*?
- Are *specific* reasons or examples included rather than vague generalizations?
- Are the arguments and reasons *strong and important*?
- Is the thinking *logical*?

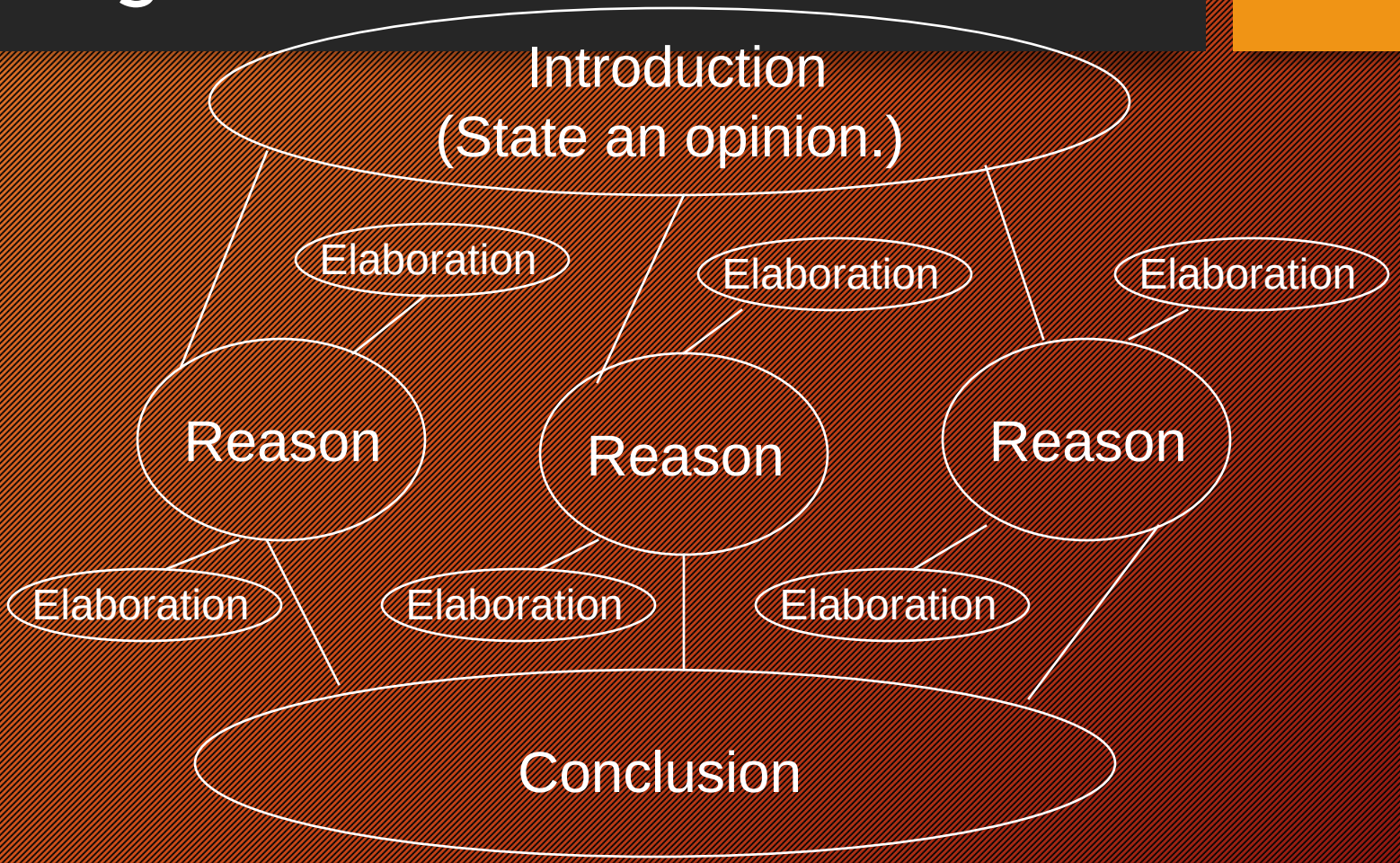
# Literature Web



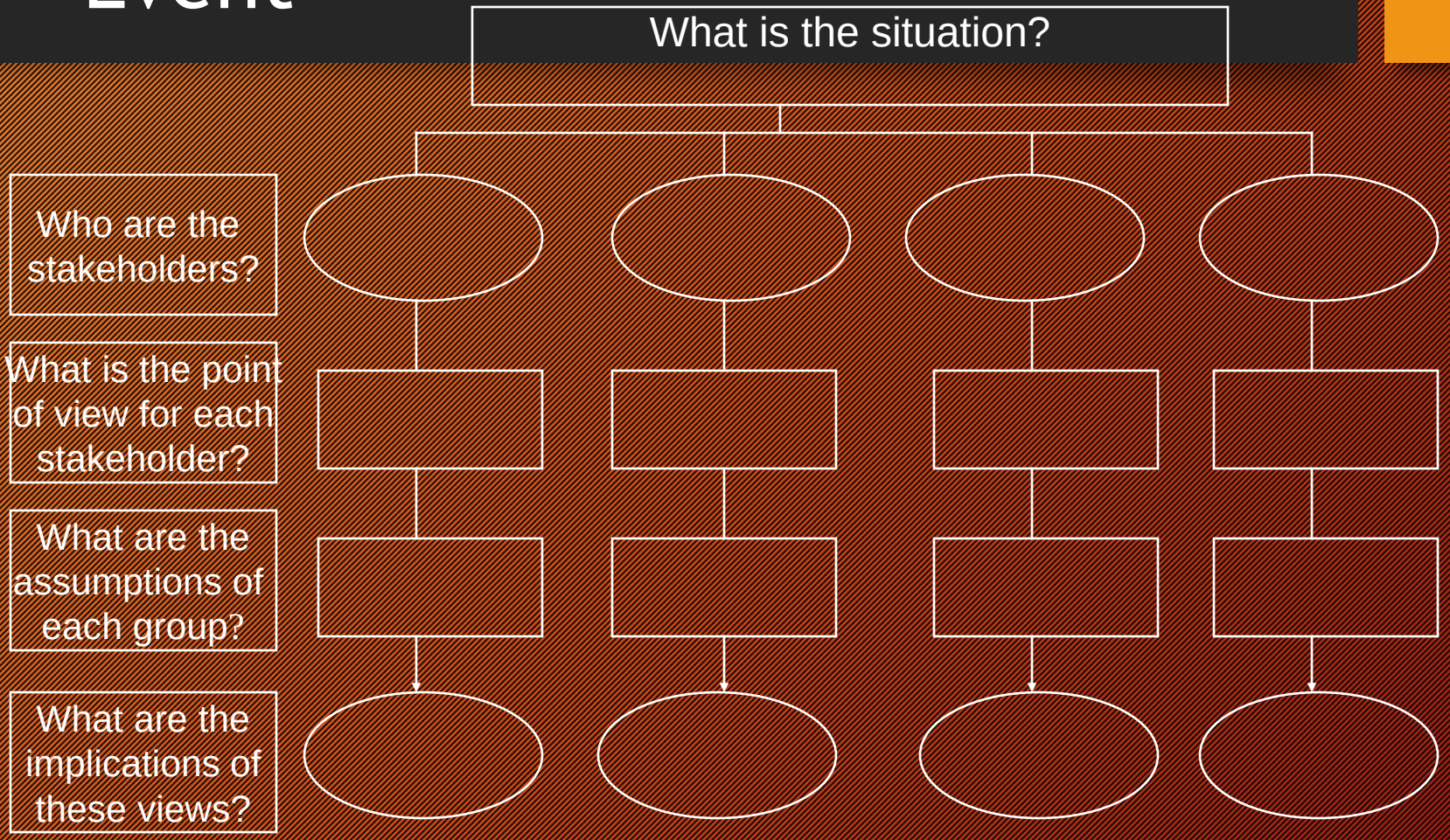
# Constructing Meaning Through Literature

- Use concept mapping techniques to explore meaning individually
- Construct whole group discussion to build more complete understanding
- Develop specific follow-up questions to probe issues
- Use direct textual passages to focus on meaning
- Employ comparison techniques to ensure transfer of literary elements

# Hamburger Model for Persuasive Writing



# Reasoning about a Situation or Event



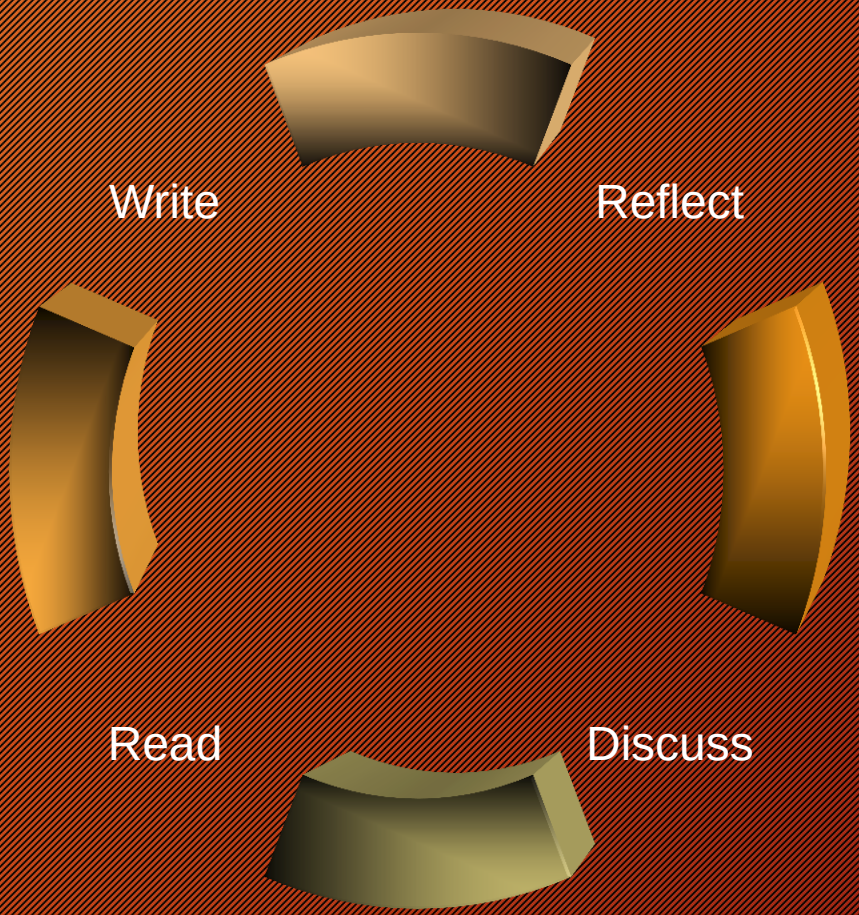
# Lower to Higher Order Questions

| | |
|---|---|
| **Memory/ Cognition Level** | **When did the election take place?** |
| **Convergence Level** | **What were the causes of the Trump win? Of the Clinton loss?** |
| **Divergence Level** | **What would have happened if Clinton had won? How would life be different today?** |
| **Evaluative Level** | **How successful was the Trump victory for conservatives, based on the criteria of economics and politics?** |

# Encouraging Thinking in the Classroom

- Ask authentic questions (I wonder why that occurred? What do you think?)
- Treat all knowledge as tentative. (Why do you think that is true?)
- Model thinking
- Use the 4-step model

# 4-Step Model to Enhance Thinking



# Metacognitive Tools

- Questions for reflection
- Journal prompts
- Problem logs
- Need to know boards

# Implications of the use of the ICM

- Provides an organizational structure for the differentiation of content, process, product, and concept dimensions of curriculum.
- Provides a design template for high level integration of curriculum dimensions.
- Provides a pathway for interdisciplinary connections.

# What Have We Learned?

- Coherence in design is necessary (blueprint).
- Tryouts and pilots are critical.
- Providing training directly on materials helps implementation.
- Use of cognitive learning models helps students internalize higher level thinking (e.g., concept mapping).
- Fidelity of implementation is essential to assess an innovation.
- Differentiated curriculum and instruction matter!

*We shall not cease from exploration, and the end of all our exploring will be to arrive where we started and know the place for the first time.*

- T.S. Eliot