Critical Thinking in the Classroom: Engagement to Assessment

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Why is Critical Thinking Important?
Information Overload

Information and the Internet

**95% of College Students use Google to
Search for Information in Course-Related Research**

*People are more likely to believe something on
YouTube than from the CDC*

71% of Adults Use the Internet for Healthcare Information

Viral Nature of Misinformation

Search ≠ Research

The Changing Nature of Education

Remembering Information

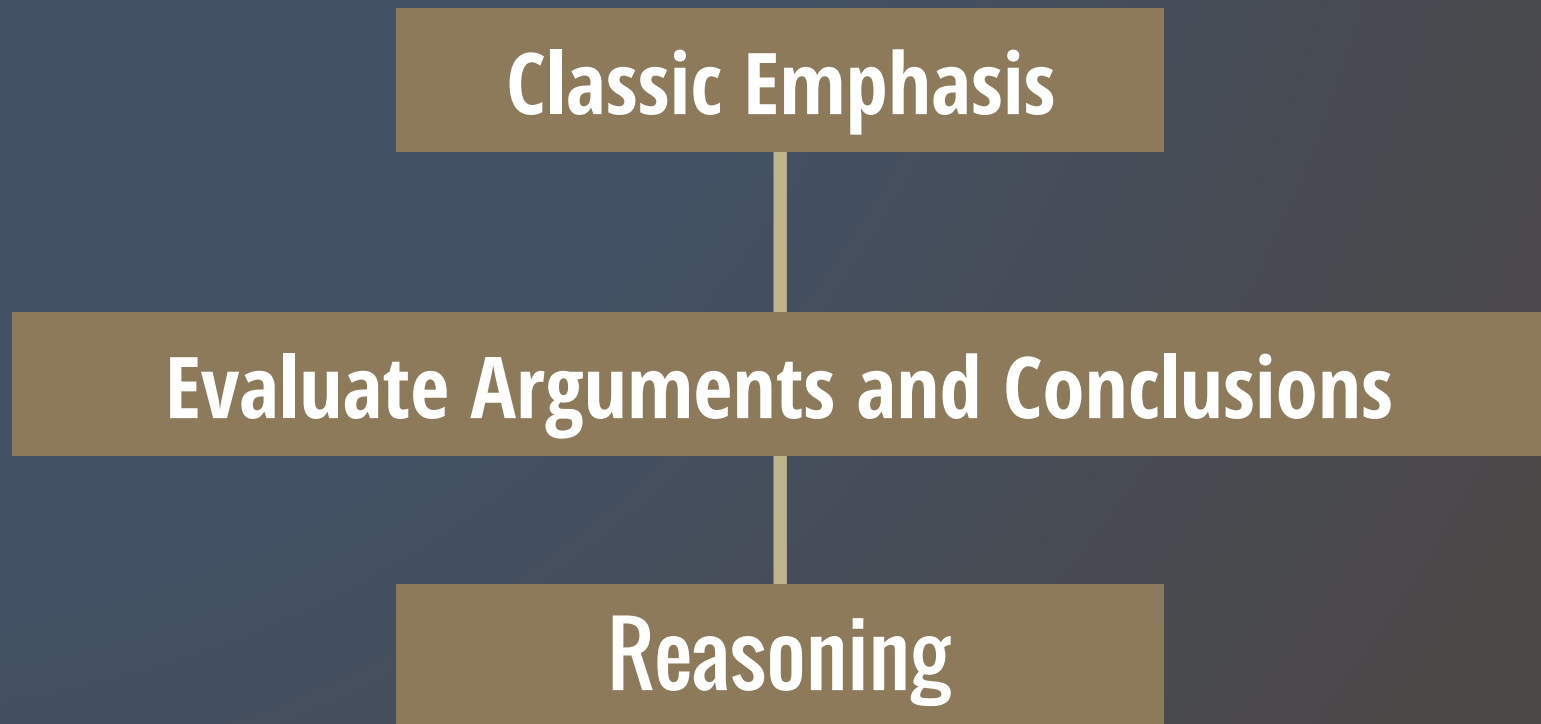Finding Relevant Information

Understanding & Evaluating Information

Using Information Effectively

What is Critical Thinking?

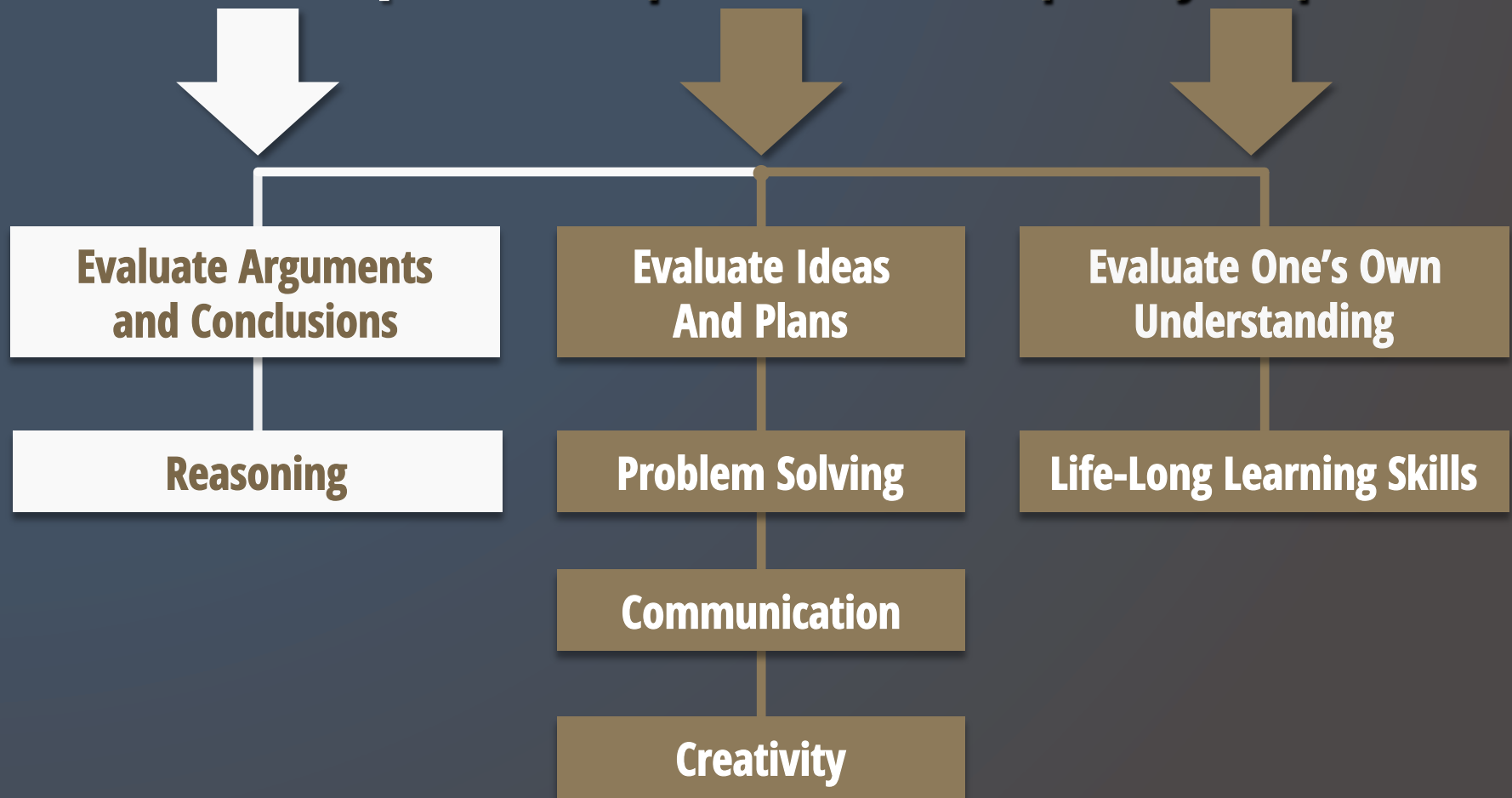**Classic Emphasis**

Evaluate Arguments and Conclusions

Reasoning

What is Critical Thinking?

Classical Emphasis   **Expanded Contemporary Emphasis**

Evaluate Arguments and Conclusions

Reasoning

Evaluate Ideas And Plans

Problem Solving

Communication

Creativity

Evaluate One's Own Understanding

Life-Long Learning Skills

Skills Evaluated by CAT Instrument

Evaluating Information

Separate factual information from inferences.

Interpret numerical relationships in graphs.

Understand the limitations of correlational data.

Evaluate evidence and identify inappropriate conclusions.

Learning & Problem Solving

Separate relevant from irrelevant information.

Integrate information to solve problems.

Learn & apply new information.

Use mathematical skills to solve real-world problems.

Creative Thinking

Identify alternative interpretations for data or observations.

Identify new information that might support or contradict a hypothesis.

Explain how new information can change a problem.

Communication

Communicate ideas effectively.

History of CAT Development

Preliminary Work At TTU 2000 - 2004

NSF

Collaborate With Other Institutions To Refine CAT 2004 - 2007

NSF

Develop Training Methods for National Dissemination & Collect Norms 2007 - 2010

NSF

Expand National Dissemination & Support Assessment in NSF Projects 2010 - 2014

Designing the CAT Instrument

Faculty Driven:
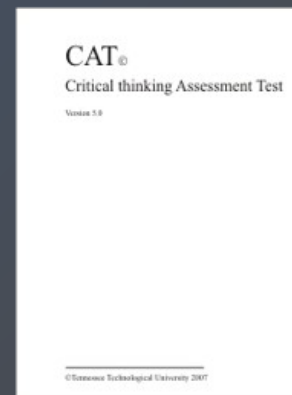High Face Validity
Involved in Scoring

Construct Validity:
Learning Sciences

**Engaging for
Students**

**Reliable &
Consistent Scoring
Essay Responses**

CAT Features

One hour exam

Mostly short answer essay

Faculty scored in workshops

Detailed scoring guide

Reliable

Valid

CAT©
Critical thinking Assessment Test
Version 5.0

©Tennessee Technological University 2007

Additional Information

Symptoms and Treatments for Dehydration

CAT (Critical thinking Assessment Test)
Version 5.0

©Tennessee Technological University 2007

Test Booklet

Additional Information Packets

Sample Disclosed Question

A scientist working at a government agency believes that an ingredient commonly used in bread causes criminal behavior. To support the hypothesis the scientist notes the following evidence.
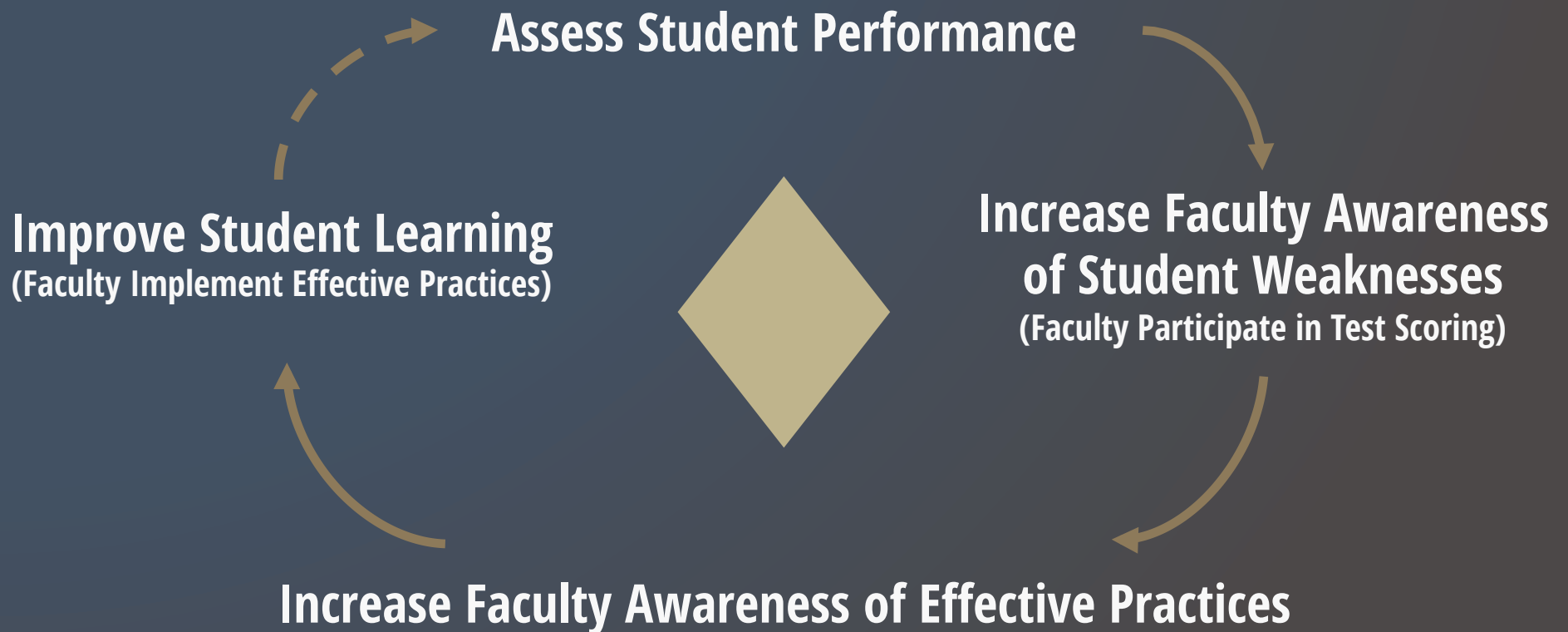
- 99.9% of the people who committed crimes consumed bread prior to committing crimes.
- Crimes rates are extremely low in areas where bread is not consumed.

Do the data described above strongly support the scientist's hypothesis?   Yes____   No____

Are there other explanations from the data besides the scientist's hypothesis? If so, describe.

_____

What kind of additional information or evidence would help support the scientist's hypothesis?

_____

Closing the Loop in Assessment and Quality Improvement

Assess Student Performance

Improve Student Learning
(Faculty Implement Effective Practices)

Increase Faculty Awareness
of Student Weaknesses
(Faculty Participate in Test Scoring)

Increase Faculty Awareness of Effective Practices

Assessment Uses of CAT

Informal Learning Experiences

Classroom Learning Experiences

Program Outcomes

College Outcomes

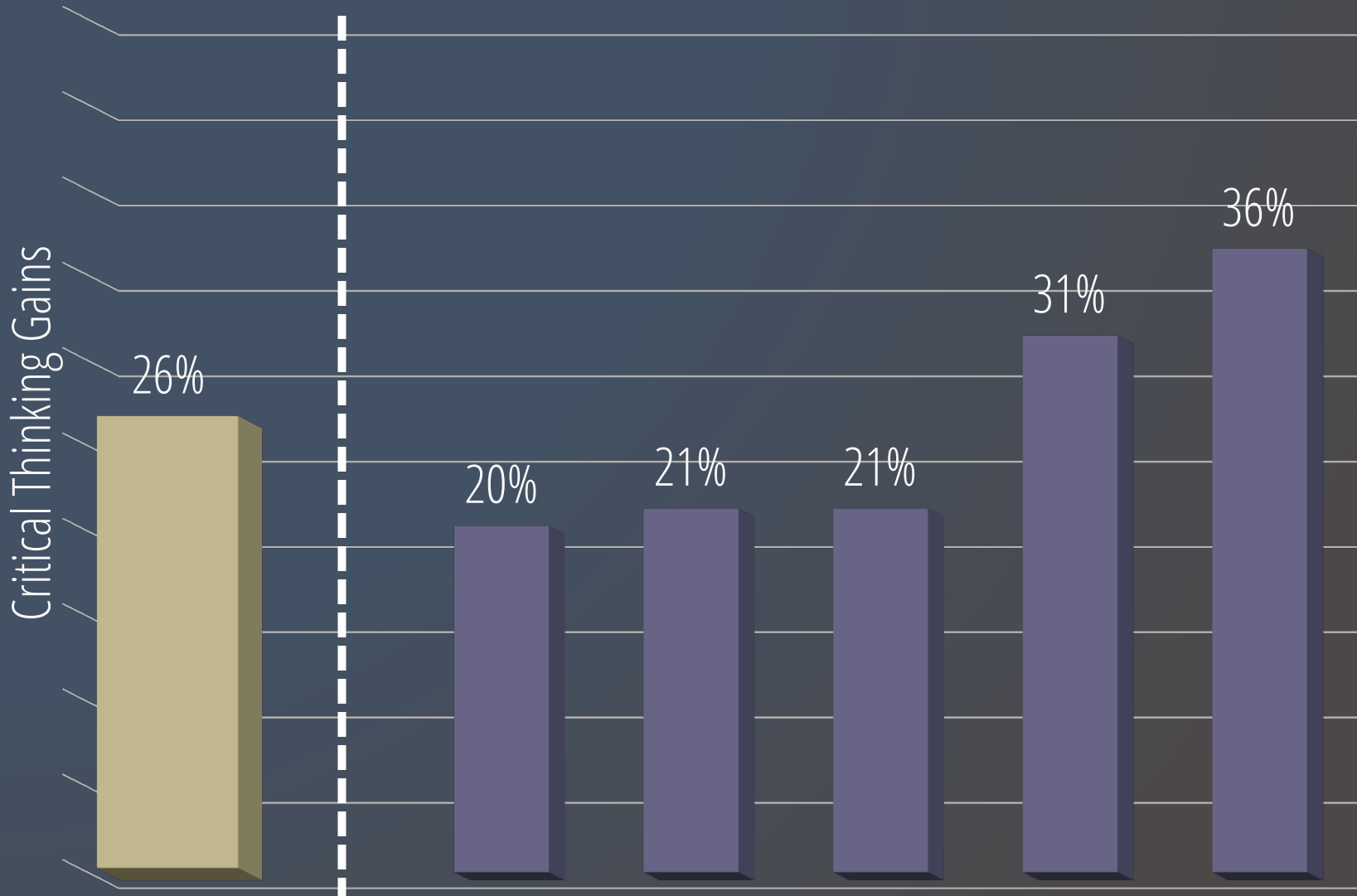# Over 225 Institutions Collaborating

What have we learned?

Academically Adrift?

OR

Academically on Course?

Teaching Critical Thinking

Successful Projects

- Clemson University
- Duquesne University
- Purdue University
- Sam Houston State University
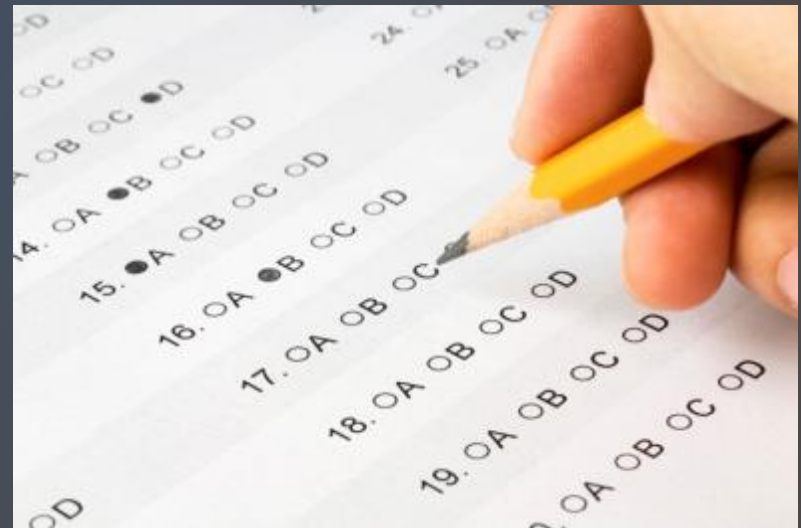
See Others @ CriticalThinkingTest.org

What have we learned?

Academically on Course?

**High Impact Practices Work
(But the Devil's in the Details)**

Understanding the Disconnect

Teaching Critical Thinking

Assessing Factual Knowledge

Why Assess Critical Thinking?

Need to Measure Success for Accountability

Assessment Drives Improvement Efforts

How We Assess - Determines What Students Learn

Benefits of Course-Based CT Assessment

How you learn determines how you will be able to use knowledge

SOLVING REAL WORLD PROBLEMS

Infusing critical thinking with discipline content prompts application

Use the CAT to Assess
Critical Thinking

ASSESSING & IMPROVING CRITICAL THINKING

Use the CAT as a Model for
Better Course Assessments

Critical Thinking Skill Set 1

How strongly does information support an idea.

Provide alternative interpretations for information or observations that have several possible interpretations.

Identify additional information or evidence needed to evaluate the alternative interpretations.
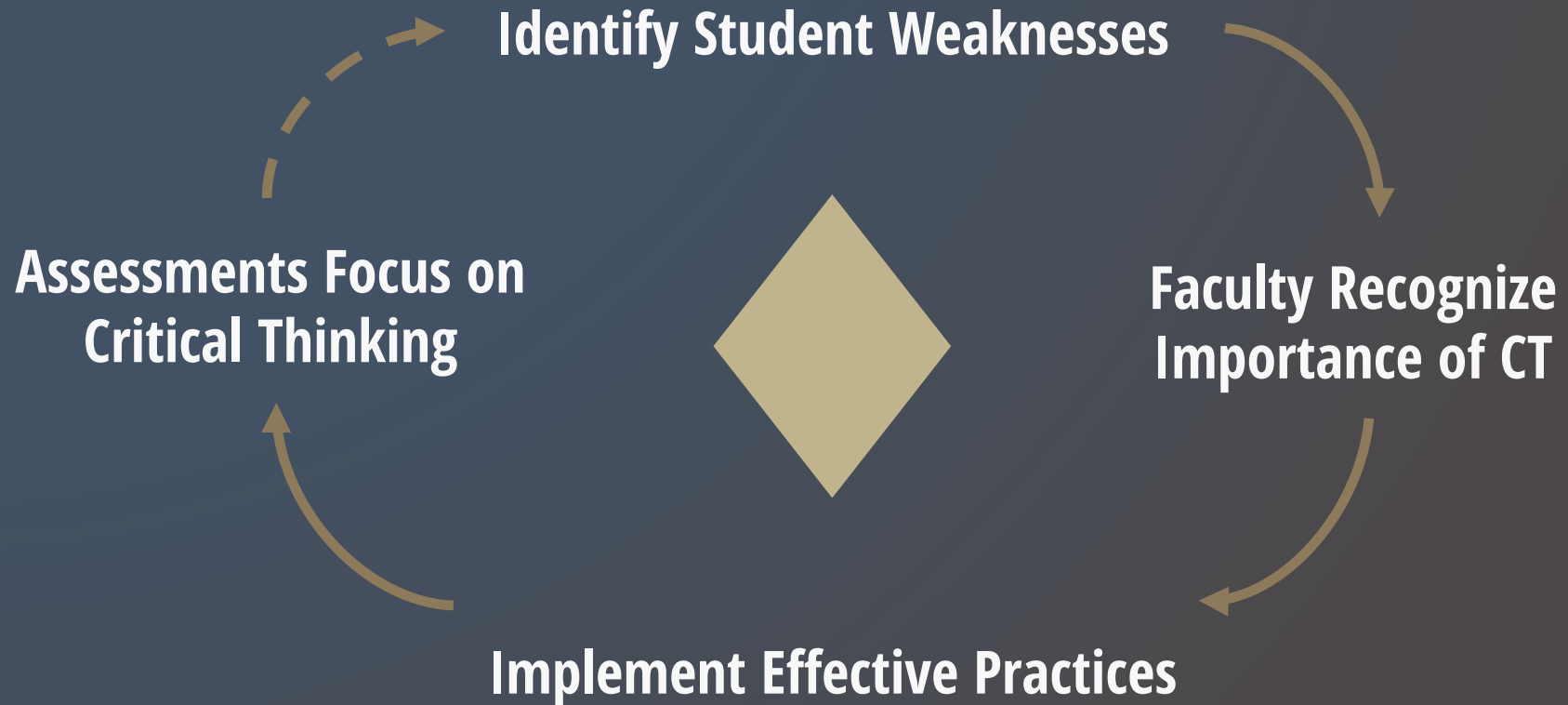
Patterns of Data

Historical Events

Literature

Thank You

www.CriticalThinkingTest.org