

CATALYZING IMPROVEMENT IN STUDENTS' CRITICAL THINKING SKILLS

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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



**Evaluate Arguments
and Conclusions**

Reasoning

Expanded Contemporary Emphasis



**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.

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.

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.

Communication

- Communicate ideas effectively.

History of CAT Development

Preliminary Work
At TTU
2000 - 2004



Collaborate With Other
Institutions To Refine CAT
2004 - 2007



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



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

CAT Features

One hour exam

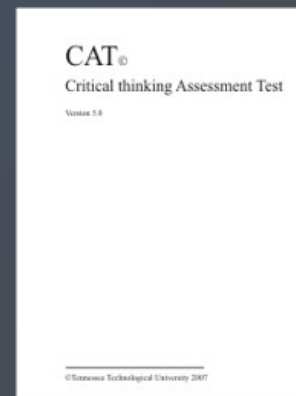
Mostly short answer essay

Faculty scored in workshops

Detailed scoring guide

Reliable

Valid



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?

Discussion Points

Did students respond the way you anticipated?

What can we learn about students from these responses?

How can we help students improve these skills?

24 Question Survey

Amount of
experience
scoring
the CAT

Obstacles
related to
change in
courses

Changes to
teaching and
assessment
practices

Motivational
factors and
available
incentives

**Amount of Experience
Scoring the CAT Instrument**



**Change in
Teaching
Strategies**



**Change in
Assessment
Strategies**

participating in even one CAT Scoring workshop led to significant change in teaching strategies

Experiential Learning

Application

Successful Training Outcomes



greater level of exposure is required to make changes in assessment practices

- Overcome deficits in training related to assessment
- Provide a model for the development of course based assessment



Model for Change

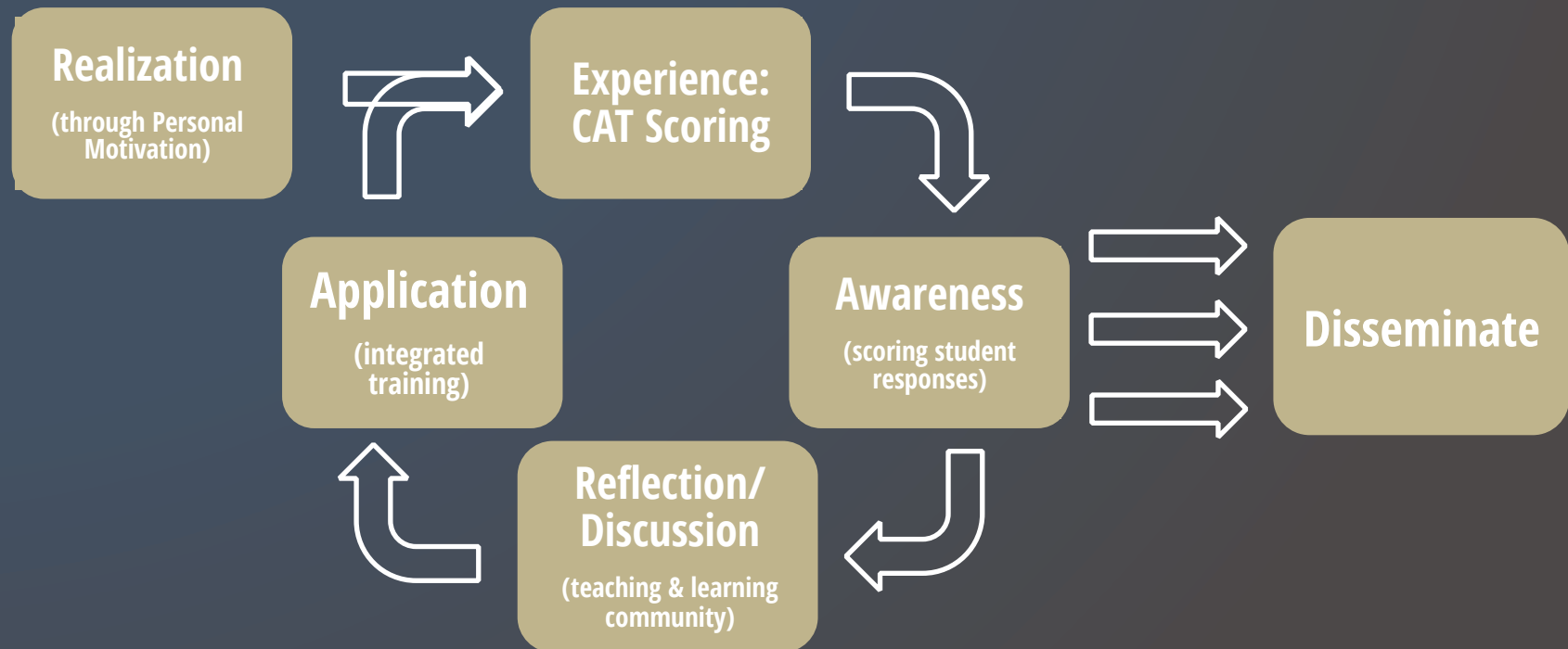
Opportunities
for training/
faculty
development
focused on high
impact practices

Obstacle–
Lack of personal
motivation

Being part of a
faculty teaching
and learning
community
focused on
improving
critical thinking

Experienced
scoring
responses from
your own
students

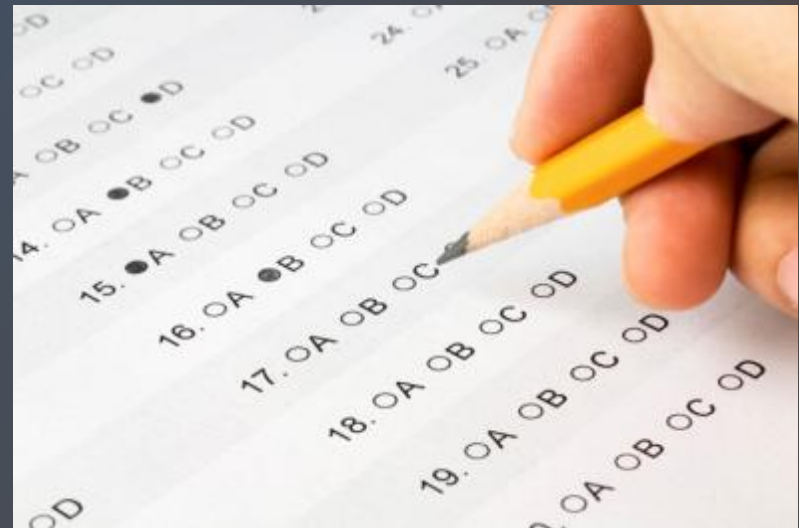
Experiential Development Model of CAT Scoring



Understanding the Disconnect



Teaching Critical Thinking



Assessing Factual Knowledge

Thank You

www.CriticalThinkingTest.org



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