CATALYZING IMPROVEMENT IN STUDENTS’ CRITICAL THINKING SKILLS

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Why is Critical Thinking Important?

Information Overload
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
- Evaluate One’s Own Understanding
  - Life-Long Learning Skills
  - Communication
  - Creativity
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

- **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
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
A 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

Realization
(through Personal Motivation)

Experience:
CAT Scoring

Application
(integrated training)

Awareness
(scoring student responses)

Reflection/Discussion
(teaching & learning community)

Disseminate
Understanding the Disconnect

Teaching Critical Thinking

Assessing Factual Knowledge
Thank You

www.CriticalThinkingTest.org

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