

Engaging Faculty in the Assessment and Improvement of Critical Thinking using the CAT Instrument

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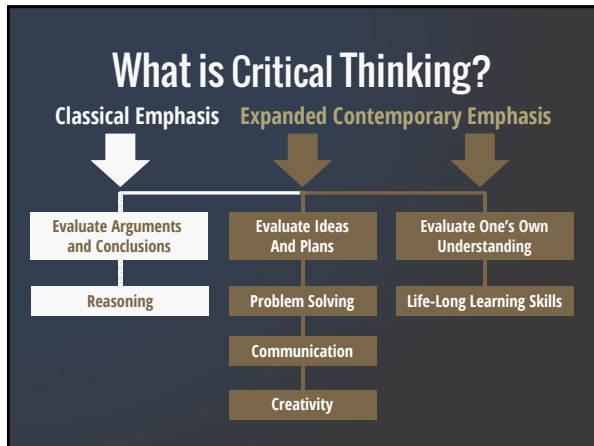
Importance of Critical Thinking

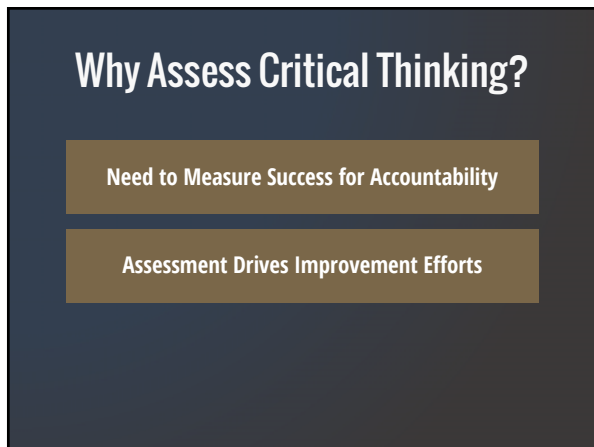
Information Overload

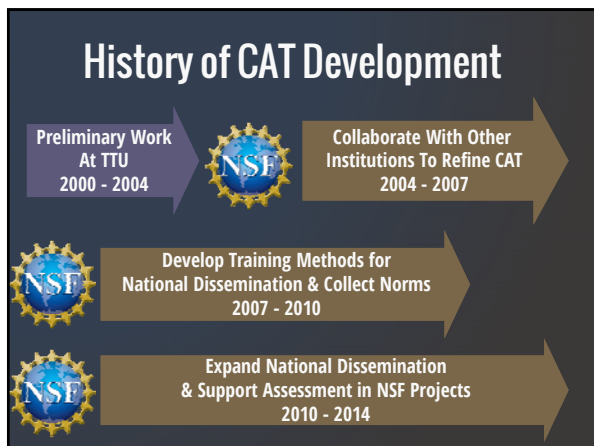


The Changing Nature of Education









Designing the CAT Instrument



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.

CAT Features

- One hour exam
- Mostly short answer essay
- Faculty scored in workshops
- Detailed scoring guide
- Reliable
- Valid



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.

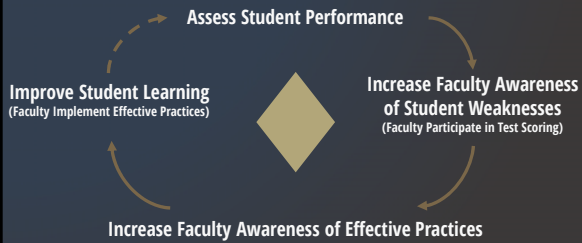
- 99.9% of the people who committed crimes consumed bread prior to committing crimes.
- Crimes rates are extremely low in areas where bread is not consumed.

Do the data described above strongly support the scientist's hypothesis? Yes ___ No ___

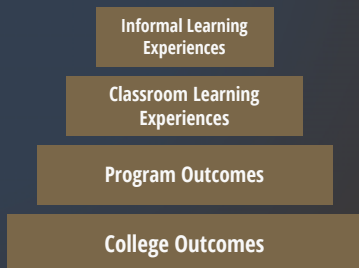
Are there other explanations from the data besides the scientist's hypothesis? If so, describe.

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

Closing the Loop in Assessment and Quality Improvement



Assessment Uses of CAT



**Critical Thinking @
Florida State University**

criticalthinking.fsu.edu

**The CAT@
Florida State University**

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graph TD; A[Primary Assessment Tool] --> B[Professional Development Opportunity]; B --> C[Faculty Training]
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Primary Assessment Tool

Professional Development Opportunity

Faculty Training

**Numbers @
Florida State University**

13 of 14 Colleges
Branch Campuses
26 Unique Majors
"Outside" Projects
4,000+ CAT Instruments Administered

Campus Impacts @ Florida State University

Discipline –
Specific Critical
Thinking
Rubrics

Changes in
Pedagogy

"by introducing that kind of real-life problem based learning, they (students) are able to identify the problem needs in their own way... instead of having the same information on the problem, they are given the opportunity to uncover their own information on the problem."

Campus Impacts @ Florida State University

Discipline –
Specific Critical
Thinking
Rubrics

Changes in
Pedagogy

Reframing Test
Questions

"If you are not testing them on critical thinking, they may still be able to figure out those definitions, but not necessarily understand the deeper meaning."

Campus Impacts @ Florida State University

Discipline –
Specific Critical
Thinking
Rubrics

Changes in
Pedagogy

Reframing Test
Questions

Discipline – Specific
Critical Thinking Assessments

CAT App: Ecology

Before 1934 in Panama City, the East Pass (now referred to as the Old Pass) was the only way to get from Saint Andrews Bay into the Gulf of Mexico. When the U.S. Army Corps of Engineers dredged the pass in 1934 at what is now St. Andrews State Park, the substantial changes in tidal flow patterns filled the East Pass with sand. Since the closure of East Pass, seagrass beds have declined, shrimping has waned, and bay scallops have completely disappeared.

Bay County commissioner Bill Dozier has been talking about reopening the East Pass since 2008, but no one's in Tallahassee or Washington has been listening. "Opening the old pass is certainly a win win for the environment. It's a win for the locally community and the bay system as a whole. It will allow that fresh sea water in and help the bay all the way around," said Dozier in 2012.*

1. How strongly does the information provided support Dozier's assertion that reopening the Old Pass will improve the ecology of the bay?

(*Taken from http://www.wjhg.com/home/headlines/Bay_County_Revisting_Old_Pass_Issue_158484075.html)

CAT App: Ecology Grading Rubric

0 pts.	Definitely Supports <i>The decline in shrimping, scallops, and seagrass since it closed indicates that the opening of Old Pass is necessary to improve the bay habitat.</i>
2 pts.	Supports with a qualifier <i>It appears that closing the pass negatively impacted the bay, and reopening it might improve conditions.</i>
3 pts.	Supports with a qualifier AND suggests alternative explanations <i>While reopening the pass may benefit the bay habitats, there are other possible reasons for the decline. (E.g., increased population since 1934 causing more pollution, increased boating activity damaging seagrass beds, changes in stormwater runoff due to development, impacts of damming freshwater tributaries, etc.)</i>

What the Noles are saying

Questioning Experts

Dr. Raymond [has] a very big emphasis on it [critical thinking]. And that has definitely led to...going out of my comfort zone if I need anything and being able to assess what you have in front of you. Asking questions even if you do not feel comfortable about it. And normally I won't go to the teacher and be like. I don't think this [textbook] is right, I think this is completely wrong.

Different Approaches to Gathering Information

...I specifically went to the Veterans Film Festival because I wanted to do more research on this [design] project and see what their lives are [like on a] daily basis ... a high sense of awareness, just [about] everything is a threat to some veterans.

Lessons Learned @ Florida State University

- Be the Partner/Facilitator Not the Expert
- Look for Early Adopters
- Campus Partnerships Go Along Way
- Encourage/Support Faculty Publications and Presentation
- Look at it as Herding Cats – Not Cattle
- Keep the Lines of Communication Open with the CAT Folks

Why Assess Critical Thinking?

Need to Measure Success for Accountability

Assessment Drives Improvement Efforts

How We Assess - Determines What Students Learn

Use the CAT to Assess
Critical Thinking

ASSESSING & IMPROVING CRITICAL THINKING

Use the CAT as a Model for
Better Course Assessments

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

Thank You

www.CriticalThinkingTest.org



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