Engaging Faculty in the Assessment and Improvement of Critical Thinking using the CAT Instrument
SACSCOC 2017 ANNUAL MEETING

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Importance of Critical Thinking
Information Overload

The Changing Nature of Education
Finding Relevant Information
Understanding & Evaluating Information
Using Information Effectively

Remembering Information
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

Why Assess Critical Thinking?

Need to Measure Success for Accountability

Assessment Drives Improvement Efforts

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
Designing the CAT Instrument

Faculty Driven: High Face Validity
Involved in Scoring

Construct Validity: Learning Sciences
Engaging for Students

Reliable & Consistent Scoring Essay Responses

Skills Evaluated by CAT Instrument

Evaluating Information
- Separate factual information from inferences.
- Interpret numerical relationships in graphs.
- Understand the limitations of correlated 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.

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.
- Crime 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
“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.”

“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.”
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. Andrew’s 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_158494075.html

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**CAT App: Ecology Grading Rubric**

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

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**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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